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PREFACE

THIS book consists of pages from the biographies of men of the modern world to whose credit lies some notable achievement. Their fields of activity are many, and they include inventors, statesmen, doctors, soldiers and men whose names will always be linked with movements for the welfare of boys.

If all that is claimed for some of these men is that they carved for themselves careers that were brilliant and rose to high office, it is no exaggeration to call others of them makers of modern history. The inventors of the motor car, the aeroplane and "wireless," the founder of the Boy Scout Movement, and the man who broke the curse of malaria have changed the world from what it was before them, and have affected the lives and interests of millions of mankind.

To all these men there came an idea, either an idea of how their life should be shaped, or of a work they should undertake. On some of them it burst with the splendour of a vision, to others it appeared faintly and took shape painfully and with the passage of time, and some seemed to have stumbled over it and had it forced upon them.

But however they found it, the translation of this idea to its reality claimed their complete devotion. It became the life-work of some of them. Often their way to success was long and bestrewn with difficulties. Aid was at times denied them, and scorn was poured on their endeavours. Some of them were forced to make a decision upon the single issue

of which lay success or failure. But whatever obstacles confronted them, they held on their way and finally reached their goal and achieved their purpose. They were men of courage, determination and often much patience; they saw with a true insight and, most of all, they held to their faith in themselves and their undertaking; and their faith was justified.

Rather apart from the rest of the book in character and content lies the last selection, but so rare is the man, who under the grimmest blows of fate can retain his serenity, so noble is the soul that sweetens with adversity, that its inclusion in the book is more than justified, and its title no exaggeration.

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P
H. G. WELLS

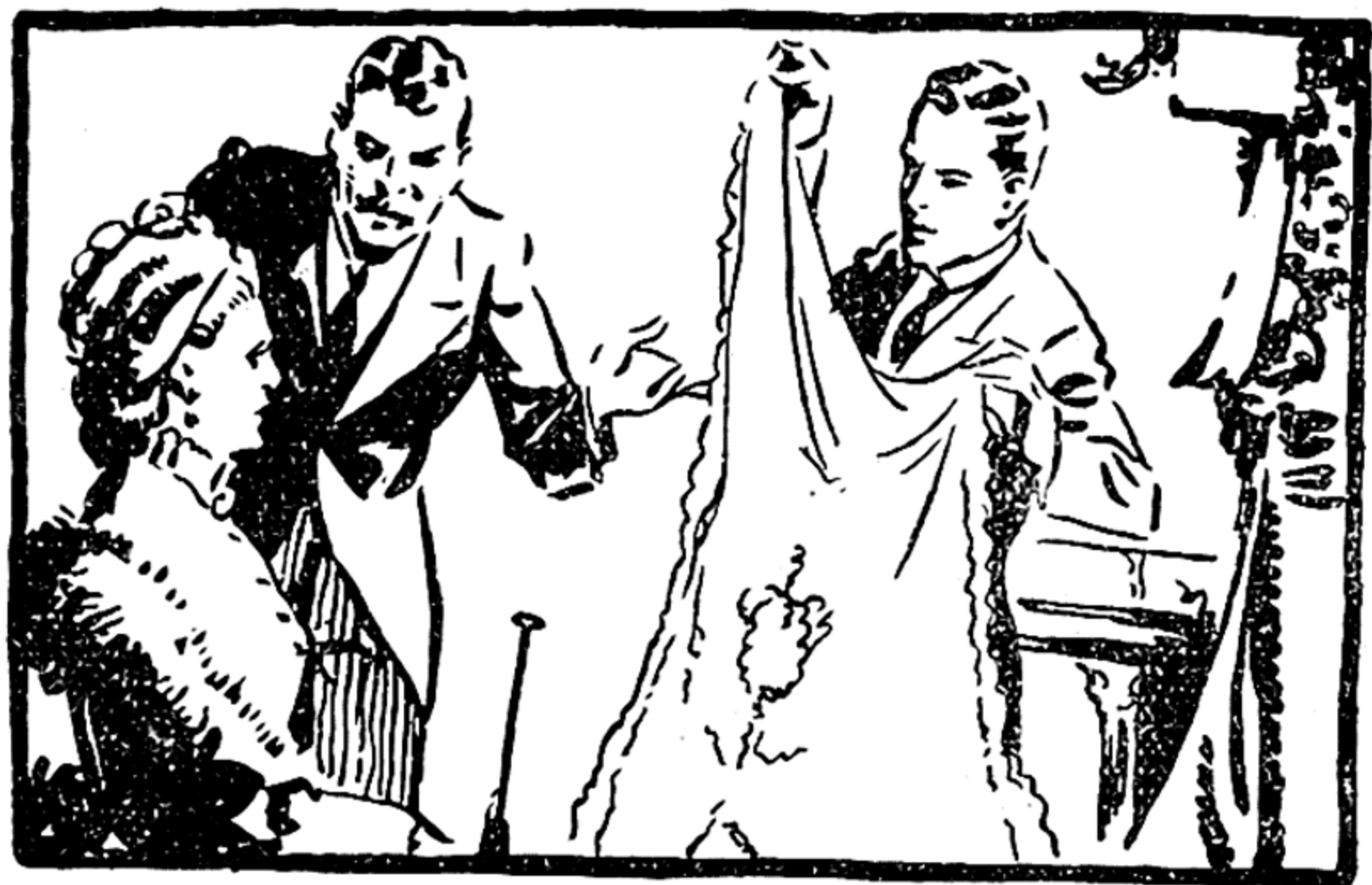
★ MR. H. G. WELLS is a notable example of a man who believed himself destined to do something of worth with his life; who was restlessly determined to find what that something was, and who in spite of difficulties, false starts, and wrong turns, realized his destiny.

His father was a gardener who had become an improvident and unsuccessful shopkeeper, his mother had been a lady's maid. Although she was a woman of character, her views were narrow, and her ambition for her son was for him to become a shop assistant. From this life H. G. Wells rebelled several times; he felt he was intended, if not for better things, certainly for different ones.

★ It is with his flight from his last job, and his appointment as an assistant master at Midhurst Grammar School, where he had had a little schooling, that our extract from his autobiography deals.

From Midhurst, science scholarships took H. G. Wells to London University. He became a schoolmaster, but ill health and his own dissatisfaction forced him out of the profession and into writing. He became one of the greatest of English novelists, but again he felt he had not reached his goal. He was bold enough to change the accepted character of the novel, and to make it the medium to expound his views of an ordered world and society.

Mr. Wells is one of the shapers of modern thoughts; from this eminence it is a long road that leads back to his boyhood behind a poor shop in Bromley, but this road he had trodden undeterred.



H. G. WELLS LEAVES THE DRAPERY TRADE

WHILE I was making my first systematic acquaintance with modern science at the Midhurst Grammar School, my mother was busy finding yet another start in life for me. She had consulted Sir William King, who was Miss Fetherstonhaugh's Agent and an important man in Portsmouth affairs, and he had recommended her to Mr. Edwin Hyde, the proprietor of the Southsea Drapery Emporium in Kings Road, Southsea. I learnt at Easter that I was destined once again to try the difficult rôle of a draper, this time under the tutelage of this Mr. Hyde. I was still unprepared with any alternative scheme. I expressed dissent, but my mother wept and entreated. I promised to be a good boy and try.

But this time I went recalcitrant, not indeed against my mother, whose simplicity and difficulties I was beginning to understand, but against a scheme of things which marched me off before I was fifteen to what was plainly a dreary and

hopeless life, while other boys, no better in quality than myself, were enjoying all the advantages—I thought they were stupendous advantages in those days—of the public school and university. I conveyed my small portmanteau to Southsea with a sinking heart. I was left upstairs in the dormitory for a time until someone could come to show me round, and I leant upon the window-sill and looked out upon the narrow side street upon which the window gave, with no illusion about what had happened to me. I can still feel the unhappiness and dismay of that moment.

Retail trade, I thought, had captured me for good. I had now to learn to work and to work faithfully for the profit and satisfaction of my prospective employers to the end of my days. I had been at large for a year and found no other way of living. The last chance had gone. At that moment I could not discover in my mind or in my world, as represented by the narrow side street into which I was looking, the little corner pub or the blind alley below me or the strip of sky overhead, the faintest intimation of any further escape.

I turned round from this restricted outer world to survey my dormitory in much the same mood as a condemned prisoner surveying the fittings of the cell he is to occupy for his allotted term. . . .

It is an open question in my mind whether this dismay at the outset, is the common experience of modern youth of the less fortunate classes, or whether because of the enlightenment of my previous starts I happened to see further and more clearly than most of my fellows. A considerable number, I think, get that caught feeling rather later. My brother Frank, after fifteen years of being good, said he could endure the life no longer and broke away as I shall

tell in due course. My brother Fred held to the religion of submission longer; he was the good boy of the three of us, and he did subdue himself to the necessary routines for the best part of his life.

What percentage of those who are bound apprentices to drapers, go on to comparative success I do not know, nor what their vital statistics are, but it is beyond all question a meagre distressful life they lead and exceptionally devoid of hope. Caradoc Evans, like myself, has been a draper, and the scene he draws of a draper's existence in the meaner shops of London in *Nothing to Pay* is, I know, true in all substantial particulars. He tells of the perpetual nagging and mutual irritation, the petty "spiffs" and fines, the intrigues and toadyism, the long tedious hours, the wretched dormitories, the insufficient "economized" food, the sudden dismissals, the dreadful interludes of unemployment with clothing growing shabby and money leaking away. There was no dole behind the "swapped" shop assistant in those days. You swam for as long as you could and then, if you could not scramble into some sort of shop, down you went to absolute destitution, the streets and beggary. Hyde was an exceptionally good employer; the place, from an assistant's point of view, was infinitely superior to my previous "crib" at Rodgers and Denyer's, yet still I recall those two years of incarceration as the most unhappy, hopeless period of my life. I was indentured for four years, but after nearly two years of it I took matters into my own hands. I rebelled and declared that come what might I would not go on being a draper.

Yet I never got to the worst experiences of an assistant's life. I never knew how it felt to be out of a crib or tasted

the full sordidness of the Caradoc Evans type of shop. I learnt about such matters chiefly from my brothers and the assistant at Hyde's. What overwhelmed me immediately was the incessancy of this employment and its lack of compelling interest. I do not know how the modern state as it develops will solve the problem of service in the distributing trades, but I am convinced it will have to be made an employment for short periods, short hours or alternative weeks and months with relays of workers, and that such special education as may be provided for it will link up the mind of the employee with the methods and novelties of manufacture on the one hand and the ultimate use of the goods sold on the other. Then the assistant would go behind the counter or into the stockroom with a sense of function instead of a sense of routine, there would be a minimum of shirking, resentment and lassitude, and he would do his job as a brisk terminable job worth doing and would find it the more interesting the better it was done. Nothing of that sort happened in my case.

It is remarkable how alien and incomprehensible the stuff I had to handle was to me. I was put first into the Manchester department, and there I found fixtures of wrapped blocks labelled incomprehensibly Hard Book or Turkey Twill or the like, rolls of grey and black silesia, flannels with a variety of names, a perplexing range of longcloths and calicoes, endless packages of diaper tablecloths, serviettes, and so forth, and rolls of crash, house cloth, ticking and the like. All that stuff had no origin and no purpose for me, except that it seemed to have been created to make my life burthensome. There were also in this Manchester department cotton dress materials, prints,

ginghams and sateens, cretonne and kindred fabrics for covering furniture; stuffs that were rather more understandable but equally irksome to handle. I had to straighten all this stock and pack it up after it had been shown and put it back into the proper fixtures; I had to measure and retold it when the manufacturers delivered it, to block it or to roll it in rolls. This blocking, rolling and folding was skilled work that needed a watchful effort, I gave grudgingly, and I never learnt to do it swiftly and neatly. You cannot imagine how maliciously a folded piece of sateen can get askew, how difficult it is to roll huckaback, how unruly a fat blanket is to pack up and how heavy and unwieldy pieces of cretonne can be when you have to carry a score or so of them up narrow folding steps and adjust them neatly on a rising pile. My department also included lace curtains. These had to be unfolded and held up by the junior apprentice while the salesman discoursed to the customer. As the heap of tumbled curtains grew and the customer still wanted to see something a little different, storms of hatred and revolutionary fervour went on behind the apathetic mask of the junior apprentice, doomed before closing time to refold them all and put them away.

Stock keeping, showing goods and clearing up, were the middle duties of the day. We apprentices were roused from our beds at seven, peremptorily, by one of the assistants; he swept hortative through the dormitory and on his return journey pulled the bedclothes off anyone still in bed. We flung on old suits, tucking our nightgowns into our trousers, and were down in the shop in a quarter of an hour, to clean windows, unwrapper goods and fixtures, dust

generally, before eight. At eight we raced upstairs to get first go at the wash basins, dressed for the day and at half-past eight partook of a bread and butter breakfast before descending again. Then came window dressing and dressing out the shop. I had to fetch goods for the window dresser and arrange patterns or pieces of fabric on the brass line above the counter. Every day or so the costume window had to be rearranged and I had to go in the costume room and fetch those headless effigies on which costumes are displayed and carry them the length of the shop, to the window dresser, avoiding gas brackets, chairs and my fellow creatures *en route*. Then I had to see to the replenishing of the pin bowls and the smoothing out and stringing up of paper for small parcels. The tediums of the day were broken for an hour or so while I went out to various other shops in Southsea, Portsmouth and Landport "matching" for the workroom, getting lengths of ribbon and material that were needed and could not be supplied out of stock, taking money from the cash desk to the bank or getting bags of small change. I loitered as much as I dared on these blessed errands, but by half-past eleven or twelve at the latest, the shop swallowed me up again and there was no more relief until after closing time, which came at seven or eight according to the season. I had to stand by ready for any helpful job. There were a hundred small fussy things to do, straightening up, putting away, fetching and carrying. It was not excessively laborious, but it was indescribably tedious. If there was nothing else to do I had to stand to attention at the counter, as though ready for a customer, though at first I was not competent to serve. The length of those days at Southsea were

enormous until closing time; then the last hour fell swiftly past me to "lights out" at half-past ten.

Half an hour before closing time we began to put away for the last time and "wrapper up," provided no customer lingered in the department. And as soon as the doors were shut and the last customer gone, the assistants departed and we junior apprentices rushed from behind the counters, scattered wet sawdust out of pails over the floor and swept it up again with great zest and speed, the last rite of the day. By half-past eight we were upstairs and free, supping on bread and butter, cheese and small beer. That was the ritual for every day in the week, thirteen hours of it, except that on Wednesday, Early Closing Day, the shop closed at five.

There was an interval of five minutes at eleven o'clock in the morning when we went upstairs in relays for bread and butter and—my memory is not quite clear here but I think we had a glass of beer. Or it may have been milk or tea. We had a midday meal about one for which we had half an hour and we had ten minutes for tea. The dining-room was airy, well lit and upstairs, far more agreeable than the underground cellar at Rodgers and Denyer's, and instead of the squalid rooms which characterized the Windsor place, with truckle beds and no accommodation for personal belongings, so that everyone had to keep his possessions in a trunk or valise, high partitions between the beds divided the dormitory into cubicles and everyone had a private chest of drawers, looking glass, pegs, a chair and so forth. For his time and trade, Mr. Edwin Hyde was a fairly civilized employer. He had even provided a reading room, with a library of several hundred books.

! Though I began this life of a draper's shop-man at the

best end, so to speak, I found it insupportable. The unendurable thing about it was that I was never master of my own attention. I had to be thinking continually about pins and paper and packages. If there was nothing for me to do then I had to find something to do and look sharp about it. But the excitement of successful learning, which had come to me at Midhurst, would not die down. For a time Latin was for me, as for Hardy's *Jude the Obscure*, the symbol of mental emancipation. I tried to go on with Latin; I wanted to prepare for more examinations. My mind no longer escaped in reverie, but I was rarely without a book of some sort in my pocket which I would try to read when I should have been combing and grooming Witney blankets for the window, or when I was out of sight of the shop-walker, as I imagined, behind a pile of cotton goods.

It became evident to those who were set in authority over me that I was an inattentive and unwilling worker. This mattered most immediately to Casebow, the head of the Manchester department, and the "improver" and senior apprentice who were between him and myself. Casebow was a good sort, but he had to keep up a rain of "Come up!" "Oh, look *sharp*!" "What in heaven are you doing now?" "What on earth are you doing here?" Over him and me ruled the shop-walker, Mr. John Key, a stately and quasi-military figure with a good profile, and a cherished moustache, very gentlemanly and dreadfully brisk, who marshalled all the forces of the shop together and did not for a moment intend that I or anyone under his sway should sink into sloth and significance. When I reflect upon him, I marvel at his all-seeing energy. He lurked

watchfully in a little desk in the middle of the main shop, from which he sallied to accost customers, lead them to the appropriate department, summon the proper assistant, "Merton forward!" "Ascough forward!" "Miss Quilter forward!" hover to intervene if the sale did not go well, answer to the cry of "Sign!" and check each transaction, introduce novelties to the departing client,—“We are showing some very pretty sunshades just now, Moddum. This for example” (startlingly opened)—and see that no part of our organization (and particularly, it seemed to me, myself) fell out of action. He found me a responsibility, and after a time I got a little on his nerves. He would remember me suddenly and inconveniently. “Wells?” he would ask. “What is Wells doing? Where on earth is that boy now?”

“Jay-Kay’s after you,” Platt or Rodgers would say.

Wells would become virtuously active at a counter where he had been invisible five minutes before. “Here, Sir. I’ve just been straightening up the longcloths.”

“Eugh!”

My life went to the refrain of Mr. Key’s disgusted “Eugh.”

The proprietor, the “G.V.”, I saw less of; he was snappy in his manner and very terrifying. But he came into the department at irregular intervals; he blew over. J.K. who was always about, always keeping me up to the mark, observant of every untidiness in my dress or any slackness in my bearing, an ever present “Eugh” of disapproval, was the living sting of my servitude. At the time I hated him beyond measure. And yet now, when I can pass judgment upon him across an interval of half a century, I see that he was really an excellent man, most anxious to guide my feet into the path of successful drapery and

without a grain of malice in his persecution. If he never let me alone for five minutes, then he did me the immense service of bringing home to me in time, just how slack, unsatisfactory and hopeless I was by nature for the calling that had been chosen for me. I could do nothing right for him from the moment when I came into the shop, with an unnecessarily careless slam of the door three minutes late after breakfast, to the time when, broom and pail in hand, I started malevolently round the corner of a fixture at the lingering customer. The parcels in my department became more and more askew; until they might have been packed, he said, by "old woman."

He wasn't "finding fault." The faults obtruded. I wasn't doing things right. Although I tried hard and tried to school myself, the humiliating fact has to be faced by an honest autobiographer, I wasn't equal to the job.

Now it is all claptrap to say that this was so because I was meant for better things. But I was "meant," if I may use that expression, for different things. I don't think I ever had any snobbishness in me about the relative values of Latin and longcloth, but it was an immense consolation to me in those days of drab humiliations, that after all I had been able to race through Euclid's *Elements*, Smith's *Principia* and various scientific textbooks at a quite unusual speed. That consolation became brighter as my prospect of winning any of the prizes in the trade or even holding my own as a satisfactory assistant, darkened. Manifestly I had not the ghost of a chance of becoming a buyer, a shop-walker, a manager, a traveller or a partner. I listened to the tales my seniors would unfold, of the long-drawn despair and hardships of "crib hunting" and rotten shops and

what it meant to lose one's "refs," with a growing certitude that that was my part of it, that was the way I should go. And, meditating on my outlook, it was inevitable I should recall the nice authoritative feeling of dictating knowledge to a class and wonder whether even for me with such an appetite for learning as I possessed there might not be prizes and scholarships in the world and some *niche* of erudition for me to fill.

Possible my mind would have run naturally towards such ideas, but Mr. Key's expostulating, "I never saw such a boy! What do you think will become of you?" was undoubtedly thought-provoking. What *would* become of me?

Might there not be some Wookey where the headmaster's certificates were in order?

This question became more urgent in my mind as I got into my second year. A fresh apprentice came and I was no longer junior; he took over those pleasant errands of matching and so forth that had hitherto fallen to me and I was kept more closely in the shop. (He had by the bye an amusing simplicity of mind, a carelessness of manner, a way of saying, "Oo'er," and a feather at the back of his head that stuck in my memory, and formed the nucleus which grew into *Kipps* in my novel of that name.) Junior apprentices wear short black coats, but afterwards they go into black morning coats with tails, and now, at sixteen, I bore these evidences of my increasing maturity. I began to serve small and easy customers. I served them badly. Rodgers and Platt my immediate seniors were far sharper at the job. And the parcels I packed were damnable.

"Get on with it, Wells." "Wells Forward." "Has

anyone seen Wells?" "Sign!" "But you haven't shown the lady the gingham at six-three! The young man has made a mistake, Moddum; we have exactly what you require." "A parcel like that will fall to pieces, man, before it gets home." And at the back of my mind, growing larger and more vivid, until it was like the world of the Lord coming to one of his prophets, was the injunction: "Get out of this trade before it is too late. At any cost get out of it."

For some time I did not tell anyone of this amazing urgency to disentangle myself. Then I tried the idea on my brother Frank, who had settled into a reasonably pleasant job at Godalming and was "living out" in lodgings. I used to go to him at Easter and Whitsuntide to spend hilarious, friendly Bank Holidays. "But what else can you do?" he asked. The second clerk in the booking desk, named West, was a man of some education who had had dreams of entering the church and who took a sympathetic interest in my spurts with the Latin grammar of an evening. I talked to him. I may have got suggestions from him. Finally I had the brilliant idea of writing to Mr. Horace Byatt at Midhurst. "Weren't there such things as ushers? Might I not be useful in the school?"

He answered that he thought I might be quite useful.

But I was indentured for four years and I had not yet served two. My mother had undertaken to pay a premium of fifty pounds and had already paid forty. She was dismayed beyond measure to find that once again, apparently, I was to come unstuck. She wept and prayed me to "try again"; Freddy was "trying." If only I would "pray for help" in the right quarter. I explained I didn't want

help of that sort from any quarter. I had discovered that the drapery business was a dismal trap and I meant to get out of it. My father was invoked and first he supported and then opposed my liberation.

★ Byatt made an offer. It was the salvation of my situation. It made my revolt reasonable. I might go as a student assistant in the Grammar School; at first he suggested without pay and then decided that he would pay me twenty pounds a year and raise this to forty after a twelve-month. He had a faith in my grant-earning capacity that I was to justify beyond expectation and this inspired him.

I had reached a vital crisis of my life, I felt extraordinarily desperate and, faced with binding indentures and maternal remonstrances, I behaved very much like a hunted rabbit that turns at last and bites. A hunted rabbit that turned and bit would astonish and defeat most ordinary pursuers. I had discovered what were to be for me for some years the two guiding principles of my life. "If you want something sufficiently, take it and damn the consequences," was the first and the second was: "If life is not good enough for you, change it; never endure a way of life that is dull and dreary, because after all the worst thing that can happen to you, if you fight and go on fighting to get out, is defeat, and that is never certain to the end which is death and the end of everything."

Among other things, during that dismal two years, I had thought out some very fundamental problems of conduct. I had really weighed the possibilities of the life before me, and when I used suicide as a threat to shake my mother's opposition to my liberation, it was after a considerable amount of meditation along the Southsea sea front and

Portsmouth Hard. I did not think suicide an honourable resort, but it seemed to me a lesser evil than acquiescence. The cool embrace of swift-running, black deep water on a warm summer night couldn't be as bad as crib hunting or wandering about the streets with the last of one's courage gone. There it was in reserve anyhow. Why should I torture myself to earn a living, any old living? If the living isn't good enough, why live?

Not perhaps with that much virility did I think at the time, but in that fashion, I was beginning to think.

I do not remember now the exact order of events in my liberation nor when it was I wrote to Byatt. But I know things were precipitated by some row of which I have forgotten every particular. On some issue I had been insubordinate, deliberately disobeyed orders. There had to be trouble. The matter was something beyond J.K., and I should have to see the G.V. At any rate I got up early one Sunday morning and started off without breakfast to walk the seventeen miles to Up Park and proclaim to my mother that things had become intolerable and this drapery experiment had to end. I think that was the first intimation the poor little lady had of my crisis.

I have told just how that happened in *Tono Bungay* and how I waylaid the procession of servants as they were coming up Harting Hill from Harting Church, I appeared among the beeches and bracken on the high bank. "Cooee Mummy," said, I, white-faced and tired, but carrying it off gaily.

The bad shilling back again!

I remember too an act of singular ungraciousness on my part. When at length it had been arranged that my

indentures should be cancelled, Mr. Hyde bethought himself of the summer sale that was imminent, when every hand, however incompetent, was welcome. "Would I at least stay on for that?" It meant another month of shop, just four weeks more. I refused obstinately, would not hear of it. There was no real need for me to go to Midhurst for a month yet; the school would not reassemble until September, but I had already anticipated a month of perfervid reading. I felt I was already nearly two years behind those fellows who went to public schools. I had to be after them without any further delay.

Still more vivid is my memory of being alone in a railway compartment between Portsmouth and Petersfield junction, *en route* for Midhurst. My small but faithful portmanteau was on the seat before me. I could not keep still, and after flitting restlessly from one window to another and back again and trying to read, I found it necessary to express my feelings by a staggering dance and a song, a song consisting, I seem to remember, of disrespectful improvizations about the Southsea Drapery Emporium, and more particularly about "old J.K." (Which Emporium was, I insist, after all far above the average of drapers' shops and very decently run, and J.K. an excellent man). But this chant and breakdown about my exodus from drapery, set to a railway rhythm, is now lost beyond recovery.

"Puff and rumble old J.K. old J.K. old J.K.

"Damn-the-boy has got away, *got* away, *got* away

"Damn-the-boy has got away, got away for ever."

Something in that fashion at any rate.

H. G. WELLS, *Experiments in Autobiography*.

DOCTOR BARNARDO

IN 1866 Thomas John Barnardo came to London from Dublin to train as a medical missionary for work in China. What leisure he had from his studies he spent in preaching in the slums. The conditions under which the very poor lived then were a disgrace to London, and it is not surprising that many of them were degraded and brutal. On occasions Dr. Barnardo's meetings were broken up, and he was assaulted. But his courage in continuing the work, and the Christian spirit he showed towards those who assaulted him, won him an esteem and popularity.

Except for the Schools of the Ragged Union, no means of education was open at that time to the very poor. Barnardo therefore started a little evening school in a stable, and there one night he learned from a destitute boy of the homeless children of London.

As Barnardo realized how urgent and how big the problem of these children was, he determined that his work lay not in China but among them.

This work, that began in such a humble way, has grown nation wide. There are Barnardo Homes, Settlements and activities all over the country. So are there men and women in all parts of the Empire who got their chance in life from their years in a Barnardo Institution. It is perhaps inevitable that there have been critics of Dr. Barnardo and his work, but the motto of his homes, "No destitute child ever refused admission" must surely count as an answer to his critics.



DR. BARNARDO FINDS THE HOMELESS BOYS OF LONDON

WITHIN ten weeks of the memorable drawing-room meeting in Dublin, Barnardo found himself established in Coburn Street, East London, training for missionary endeavour among the Chinese. On setting forth from Dublin he carried letters of introduction both from the Open Brethren and the Y.M.C.A., commending him to fellowship among Christian workers in London. And although his missionary curriculum was exacting, he nevertheless found time to embark immediately on Christian service in East London. Was not *the world* God's vineyard? How, later, could he minister faithfully in China if, meanwhile, he closed the bowels of his compassion to the needs of East London? Such was the logic of his position, and he took it to heart. Scarcely had he discovered his new landmarks when he discovered

also the location of Ernest Street Ragged School; and to its staff he at once volunteered his aid.

Of the academic side of Barnardo's first months in London, scant record remains. One point, nevertheless, stands out. When he left Dublin he left solely to train as an Evangelical missionary, the idea of studying medicine never entering his mind. His purpose was to take two or three years' training in Bible subjects, and then set forth to China. But of the practical side of those early days the evidence, from the start, is clear. Into his Ragged School endeavours he threw himself with zest; and so great was his power over rough lads that in a few weeks he was urged to accept the superintendency of the institution. This he did, with results indicating that he had his own ideas as to how a Ragged School should be run. So, as later will appear, it was not long before his aggressive—perhaps imperious—innovations, conflicted with the conservative procedure of his colleagues; and chafing under their yoke he finally jumped the traces—to “try out” his cherished ideas in a free field.

Meanwhile, as in Dublin, the labours of the Ragged School by no means monopolized his zeal. Here, too, he felt himself called upon to *preach* the Word in the highways and by-ways; and among his early London experiences none is more illustrative of the man than his street-preaching exploits. The challenge of open-air preaching roused all the energy of his being; and the fact that he had done obeisance before Agnostic shrines helped him to understand and refute the arguments of his rationalistic opponents; for however proud he had once been of his “philosophical” doctrine, he now adjudged it an empty husk. One debt, nevertheless

—whether he recognized it or not—Barnardo owed to his youthful allegiance to rationalism. It taught him the value of cogent reasoning; and although, after conversion, he came to esteem other elements of personality more illuminating than pure reason, he never despised the faculty of reason as such. To the end, he defended by rational argument the position to which he was led by faith. All he now demanded was that reason work in harmony with other attributes of personality—especially faith, intuition, imagination and spiritual experience. Briefly, Barnardo's quarrel with the rationalistic attitude was that frequently it strove to subjugate faculties with which it should have co-operated on a basis of mutual respect, while, not infrequently, it became the defender of social wrong. Therefore, in all his preaching, he advocated the symmetrical development of the whole personality.

The indomitable spirit of this street-preacher is illustrated by an incident which occurred shortly after his arrival in London. One evening, seeing a throng of boys and girls entering a "penny-gaff," Barnardo, desirous of ascertaining the nature of the entertainment, followed them. But soon his blood was boiling. "As I looked down from a side box" he says, "upon their eager faces drinking in the abominations of the place, I stipulated with the proprietor for permission to go upon the stage during the interlude, and address a few words to the lads." The proprietor would agree only on condition that Barnardo pay him £5. Yet, extortionate as was the charge, the enthusiast consented, and handing over half the fee in advance, demanded that he be permitted to finish his speech without interference from the management. To this the proprietor agreed,

believing that the audience would quickly terminate the address.

Accordingly, when the curtain rose, the young student, "instead of the highwaymen who were to have appeared," occupied the stage. At once he was recognized by hundreds, some greeting him with cheers, others with jeers. When the first uproar subsided, he shouted that if the crowd were quiet he would sing a song.¹ Silence ensued ; the song was sung ; and "having gained complete attention" he "spoke forcibly of the wrong and harm they were doing themselves by being present in such a place," pointing out "in simple terms the joy . . . of the Christian life."

The audience was dumbfounded. Barnardo was now master of the situation ; and, seizing the opportunity, he bearded the lion in its den. But when his denunciation was at its height, the lessee rushed furiously upon the stage, demanding that he leave at once. "Not for ten times £5," he shouted, "will I permit such an address!" The stage was now a storm centre, while the auditorium resounded with shouts. Barnardo's speech was abruptly terminated ; but the enthusiast was unabashed. Turning to his interrupter, he rejoined : "Well, I will leave if you insist upon it ; but in that case, as you have broken your bargain, you must give me back my money and allow me to tell the boys why I leave." This point the proprietor reluctantly conceded ; and Barnardo, depositing in his pocket the returned £2. 10s., shouted out : "My lads, I am not allowed

¹ Up to the time of his conversion (1862) Barnardo exhibited no talent for, or interest in, music ; but immediately following that event his emotions responded to music's call, and realizing its value in worship he set to work and developed a strong, melodious singing voice.

to finish . . . but if you care to listen I shall be outside in front of the house, and will talk to you afterwards." Then, "the curtain coming down amidst 'Kentish fire' and three cheers," he disappeared.

But the scene was not closed, and the next episode Barnardo himself must tell : "To my surprise, in a twinkling the benches were emptied ; the whole house poured out after me. Gathering the crowd around me in front of the 'gaff,' I stood upon a costermonger's barrow and spoke more plainly and fully than I had done before, reasoning of 'righteousness, temperance and judgment to come,' while finally I commended all of them to God in a brief prayer. 'Good night, sir,' 'Thank you,' 'God bless you,' 'We wish you'd come again,' mingled with more quiet but not less sincere expressions of gratitude, closed this interesting scene as the youthful crowd dispersed and I retired homeward, thankful for the fresh opportunity afforded me of speaking the word 'in season' and 'out of season' as the case might be."

Not always did this enthusiast find himself master of such situations. One evening, for instance, when visiting the public-houses in a notorious quarter to sell Bibles, he found himself in a sorry plight. Entering a certain beer-house, he sold what copies he could at the central bar and was passing toward the parlour, whence issued "the sounds of riotous mirth," when the publican begged him to desist, declaring that if he entered dire consequences might ensue. Barnardo, however, was not to be deterred. Believing his mission a sacred one, he pressed on. Inside the door, his vision was obscured by a cloud of tobacco smoke which "completely filled the room"; but soon he discovered him-

self to be in a "long, low, narrow" den, crowded with "lads and girls of from fourteen to eighteen," most of them intoxicated. Two huge fellows, moreover, had backed against the door, thus cutting off retreat. Nothing remained but boldly to fulfil his task ; and from it he did not flinch.

"Advancing to the centre of the room," he says, "I declared that I came to sell them the Word of God, and announced that I could give the whole Bible for threepence and the New Testament for a penny." But these revellers would hear of no payment. "Come, old fellow, chuck 'em out !" shouted one. "None of yer palaver ; let's have the books !" roared another. Barnardo was adamant : "I was determined not to part with the books unless I received payment ; and leaping upon the table in the centre of the room I appealed to them to deal fairly by me, adding that *these books cost me exactly double what I was selling them for*, and that therefore they ought to pay like honest men for what they wanted." Argument was futile. In answer came another chorus : "Chuck 'im down !" "Bonnet 'im !" "Put 'im out !" Yet, temporarily, presence of mind saved the situation. As at the "penny gaff" he volunteered a solo ; and all joined uproariously in the chorus. But such expedients could not long stave off the madness of this drunken crew. Crowding around the table, they tumbled it over, plunging their victim headlong on the floor.

This proved the signal for further ribaldry. Before Barnardo could gain his feet, several youths grabbed the table, and, placing it, legs upward, on his body, began to dance upon it a "devil's tattoo." The result may be imagined. The Bible-seller was removed to his lodgings

unconscious : examination showed that everywhere his flesh was bruised ; and two of his ribs were broken. Yet, from his own description, no ill effects ensued : “ I was not dangerously injured and after the exhaustion of the shock had passed, and firm bandages had been applied, I felt but little inconvenience from the fracture, although it was quite six weeks before I regained my strength.”

On recovering consciousness, Barnardo was waited upon by a policeman to know if he would prosecute the ring-leaders ; but the inquiry was met by a categorical negative : “ I have begun with the Gospel, and I am determined not to end with the law.”

This reply was noised abroad, with results of which Barnardo little dreamed. Next night, in the same “parlour,” his assailants met again, now sober ; and there they decided that henceforth no one should injure a hair of his head. But their gratitude found other expression. Every day, during his convalescence, there called at Barnardo’s lodgings a deputation from this gang to inquire about his condition, and so assiduous was their attention that it became “almost a nuisance.” The net result of the experience was, nevertheless, all to the good, for concerning it Barnardo wrote : “ I believe this incident . . . gave me a greater influence over the rough lads and girls of that quarter than I could have attained had I been preaching or teaching among them for years.”

Up to this time, there is no evidence that Barnardo intended to study medicine. But as month succeeded month, Hudson Taylor, a rare judge of men, divined in him the special gifts required for a *medical* missionary ; so it was arranged that he enter upon an abridged course of medical

study to fit him for fuller service abroad. Accordingly, on October 1st, 1866, Barnardo, now twenty-one, entered The London Hospital.

His impression upon student associates was not favourable. He was older than most students commencing medicine, and the crude horseplay so characteristic of medical freshmen, was highly repulsive to him. But while fellow-students sneered, Barnardo was winning the esteem of those destined to prove his lifelong friends—the East End poor. Scarcely was he established in The London Hospital when the cholera epidemic of 1866 broke out, and East London proved its chief seed-plot. Frantic with alarm, the authorities called for volunteers to stay the plague. Barnardo at once proffered his services, and during the weeks of that struggle few laboured more valiantly than this street-preacher—“dropped” by “the smart set” amongst his fellow-students. The experiences of those cholera days stood Barnardo in good stead. Then, more closely than ever before, he met face to face the ghastly problems of poverty and destitution; for during those weeks he witnessed as many as sixteen deaths in one day—the result of dire neglect. Of the thousands of cholera victims in London, more than sixty-five per cent were cut down amidst East End slums.

The horror of those days Barnardo's memory could not efface. The stampede of terror-stricken souls; the sight of corpses “piled up” awaiting burial; the spectacle of old and young writhing in agony; the anguish issuing from desolate hearths: above all, the vision of little children orphaned and destitute by the ravages of a preventible plague.

This pestilence over, Barnardo returned to a life more eventful than before. His new experience made him dream of the vast possibilities of East End Mission work. Hence, into the superintendency of his Ragged School, into his street preaching and Bible distribution, he threw himself with renewed zeal. But his path was not smooth, and often he encountered humiliation. Once, when he was conducting a street service, a clever imp decided "to distinguish himself." Before the meeting there had been a downpour of rain ; so the youngster, soaking street dirt in water, kneaded pellets "about the size of small eggs," and thus armed, awaited his prey. Let the victim conclude the tale : " With my hat in my hand, I had just opened my mouth in prayer when, lo and behold, it was neatly and tightly plugged, so . . . that I could neither shut my mouth nor eject the missile ! Of course I instantly opened my eyes and found everyone around me convulsed with laughter ! The boy was gone ! "

On such occasions Barnardo's sense of humour won the day, for even as a youth he possessed that rare gift which permits one to laugh heartily at one's own expense. Gradually, therefore, by dint of perseverance, he came to win the confidence of even the roughest classes. On a certain evening, for example, he arranged to hold a cottage service in Hope Place, a blind alley in a rough part of Stepney. Invitations to attend were circulated in different quarters, including several "pubs"; and a group of half-drunk rowdies, led by a local "bruiser," decided to attend—intent on giving the preacher "some fun." At a signal from the "bruiser," the meeting was to be interrupted and the preacher carried bodily into the street, where a "jolly good hiding" would be given him.

Such was the plan. At the hour arranged, the "pub" party stumbled into the room, filling half its space. But imagine the leader's thoughts when gradually it dawned upon his half-stupefied mind, that the preacher he had come to molest was none other than the medical student who, risking his own life, had attended him during his cholera illness. How could he assault this man? He was no such cur as that! But Barnardo, too, recognized "his man," and although he never dreamed of the gang's purpose, he preached to their leader as though his own soul depended on that one man's conversion. The ruffians, however, soon grew restless. Why was the bruiser delaying his signed for "the fun"? Had he lost his nerve? Was he cowed by the preaching of this "little man with the big head"? Finally one fellow broke out: "Hey, bruiser! Wat abart th' fun"? The leader, sobered by the situation, now jumped up and, turning to his pals, exclaimed: "If any o' you chaps touches this man, you settles wi' me!"

Some of the gang, disgruntled at this rebuff, filed out of the house; some stayed with their leader. But before the termination of that cottage service, the notorious fighter requested Barnardo to pray for him. He went home that night a humbled man, determined, at any cost, to find peace with God. Thus, groping in darkness, he sought the Light; and later, after a desperate struggle, and under Barnardo's influence, he entered into the consciousness of a twice-born soul.

This "bruiser," so dramatically converted to the service of God, was William Notman: one of the best workers Barnardo's cause has known.¹

¹ Two of Notman's sons became ministers of the Gospel and wrought of noble work among the East End poor.

But ere the year 1866 had run its course an event, more pregnant with consequence than anything related above, thrust itself athwart Barnardo's path, and carried captive his heart for life.

After months of service at the Ernest Street School, and while continuing his labours as its superintendent, Barnardo, supported by two or three students, opened a new experimental ragged school. Yet, often as he chafed under the stereotyped ideas of his Ernest Street colleagues, his new venture was in no sense a counterblast to that institution. On the contrary, it was initiated as a sort of supplement, its chief labours being undertaken at hours when the Ernest Street School was closed. In short, the project was designed as a testing-ground, wherein Barnardo was free to experiment with ideas peculiarly his own.

This tiny school, situated in Hope Place, was a humble affair. It was housed in a dilapidated cottage which for years had been used as a donkey-shed, and which Barnardo rented at two shillings and sixpence a week. Without delay he and his friends had put it in order for human habitation. This meant laying a floor to cover the earth, whitewashing walls and ceiling, and repairing a fireplace which had long been out of gear. Finally, late in 1866, the donkey-shed, now transformed, was opened as a Ragged School.

With the ups and downs of this school we are not concerned. One co-related incident, however, is historic. Shortly after its opening, on a wild winter's night, there passed through its doors a peculiar character. He entered with no desire to be taught; he wanted shelter, warmth—if possible, food. During school proceedings, he wormed his way close up to the blazing fire, and there, perched on a box,

stared into the vivid flames, a wild content written on his face.

But the last session of the school now over, it being time to bolt the doors, Barnardo, looking around, observed this youngster lying on the floor, crouched like a dog before the glowing coals, and half hidden by the box on which he previously had sat. Feeling that almost by chance the lad had escaped imprisonment in the school, Barnardo accosted him sharply:—

“Here, my lad! Wake up! And off home to your mother! You’ve nearly been locked in this place overnight.”

“Well, that w’d suit me foine, sir!”

“What! You young rascal! Away home to your mother!”

“Ain’t got no mother, sir.”

“Well, then, off to your father.”

“Got no father neither, sir.”

“Away then to your home, wherever it is.”

“Oi’ve got no ’ome, sir.”

“Well, off then to your friends, wherever you live.”

“Ain’t got no friends, sir! and *Oi—don’t—live—nowhere!*”

Barnardo was incredulous. Hundreds of urchins had tried to hoax him before; he was no easy prey. Yet this youngster told his story with a ring of sincerity. Could there be any truth in it? Was he, in fact, a street-arab without friends or abode? The medico turned up the gas and called the boy to his side. With “slow, heavy steps” the urchin drew up—“as though his feet were weighted.” Barnardo scrutinized him. Neither shirt nor under-clothing protected his spare frame: his feet and legs were bare,

although the weather was freezing. His only apparel consisted of a jacket, short trousers and cap; all worn to rags. His chief covering was a thick coat of dirt.

Here was a strange case, and Barnardo determined to ferret out the truth.

"How old are you, my lad?"

"Ten, sir."

"What's your name?"

"Jim, sir. Jim Jarvis they sometimes calls me; but oi only knows oi'm Jim, sir."

The lad's physique suggested a child of seven, or at most eight. But "his face was not the face of a child." It bore "a careworn, old-mannish look, only relieved by the bright, keen glances of his small, sharp eyes." But, as Barnardo peered at him, his problem grew more perplexing. The child's countenance was "sadly overwise"; and his pathetic appeal—eloquent even when mute—together with his "querulous, high-pitched tones," produced in his questioner "an acute sense of pain." But sentiment was no substitute for fact, so the examination went on. Either the lad was lying or Barnardo was on the threshold of a revelation.

"Now, my boy," he demanded, "do you really mean to say that you have no home at all, and that you have no father or mother or friends?"

"That's the truth, sir. I ain't tellin' you no lies!"

"Where, then, did you sleep last night?"

"Down in Whitechapel, along o' the 'ay market, in one o' them carts filled with 'ay, sir."

"How was it you came to the school?"

"'Cos, sir, I met a chap as I knowed, and he tell'd me to

come up 'ere to the school to get a warm; and 'e sed p'raps you'd let me lie nigh the fire all night."

"But you must know we don't keep open all night."

"Yes, but I won't do no 'arm, sir, if only you'll let me stop! Please do, sir! It's so cold outside!"

Now, "with overwhelming force," there rushed across Barnardo's mind the thought: "Is it possible, that in this great city there are others also homeless and destitute, who are as young as this boy, as helpless, and as ill-prepared as he to withstand the trials of cold, hunger and exposure?" Surely, he reflected, it was unthinkable that London, with its "vast wealth, open Bibles, Gospel-preaching and Ragged Schools," could be harbouring such inhumanity. There followed, therefore, a piquant question:

"Tell me, my lad, are there other poor boys like you in London without home or friends?"

A "grim smile" lighted up the urchin's face, as promptly he replied:

"Oh yes, sir, lots—'eaps on 'em; more'n I could count!"

Barnardo stood aghast. Jim Jarvis was an enigma! Almost he had believed the lad's story. But this last statement was surely a fabrication.

One thing, however, must be done; the youngster must be fed and sheltered for the night, and his strange story explored. Meanwhile, as Barnardo led the way to his rooms, a further query was made:

"Now, Jim, if I give you some hot coffee and a place to sleep in, will you take me where some of these poor boys are, as you say, lying out in the streets——?"

"That oi will, sir, and no mistake."

Barnardo led the way to his "digs," where Jim proved his prowess before a jug of coffee and a formidable pile of bread and butter. "I almost feared to supply him," says Barnardo, "with such voracity did he swallow the food."

Now warm, and better fed than he had been for months, Jim became verbose. His father he "never know'd nor heard of"; his mother was always sick, and died in the "'firmary"; he himself was in the workhouse for a while and ran away; later he was the slave of a drunken barge-man, "Swearin' Dick," who beat him atrociously; while, after escaping from this wretch, he had been wandering about London "pickin' up what he cu'd." Almost daily he was buffeted from pillar to post by the police; once he was locked up for sleeping out. When specially fortunate he had tasted the luxuries of threepenny lodging-houses: but such indulgence had its disadvantages, for generally he left with a load of vermin more hungry than himself.

This, and much more information of like sort, the youngster volunteered. But when he paused, Barnardo interrogated him again:

"Jim, have you ever heard of Jesus?"

"Yes, sir; I knows about Him a'right."

"Well, who is He? What do you know about Him?"

"Oh, sir" he looked sharply about the room—with a timorous glance into the darker corners—then, dropping to a whisper, exclaimed: "He's the Pope o'Rome!"

"Whatever do you mean, my lad? Who told you that?"

"No one, sir; but I knows I'm right. 'Cos, mother, 'fore she died, always *did that* when she spoke of the Pope"—a clumsy sign of the cross was made—"and one day, when she wor a-dying in the 'firmary, a gent wor there in

black clothes a-talkin' to her, an' mother wor a-crying. They began to talk about Him, sir, and they both did the same."

"Then because your mother made the same sign . . . when she spoke about the Pope and about Jesus, you thought she was speaking of the same person?"

"Yes, sir, that's it." The boy gave a nod of pleased intelligence.

Shocked by this revelation, Barnardo lost not a moment in relating to the urchin the story of Bethlehem's Babe. He told him of Jesus' tenderness and compassion, of His sympathy and mercy, of His love for children, of His miracles of healing, and of how He preached the Gospel to the poor. Then he explained in simplest terms the growing jealousy of scribes and pharisees, the traps laid to catch Him, His trial before Pilate, His scourging, His crown of thorns. Tears trickled down Jim's face; but when he came to the Crucifixion, the lad, breaking into sobs, exclaimed:

"Oh, sir, that wor wuss nor Swearin' Dick sarved me!"

The story concluded, Barnardo put his arm around the boy's neck, and both knelt in prayer.

It was long after midnight when the two, hand in hand, sallied forth on their quest. The urchin, proud in the consciousness that he was leading, kept tugging ahead. Soon all important streets were left behind, and passing through a maze of alleys they came at length upon "a long, empty shed," used by day as a second-hand-clothes market. For some minutes they stopped to examine its dark recesses; but no child was found. Doubts again entered Barnardo's mind; was the youngster hoaxing him, after all? Jim was unperturbed: "All right, sir; don't look no more. We'll

come on 'em soon. They dursn't lay about 'ere 'cos the 'p'licemen are werry sharp all along by these 'ere shops. Wunst, when I won *green*, I stopped under a barrer down there . . . but I nearly got nabbed, so I never slep' there again."

He led his companion through narrow lanes till they entered a blind alley; and, nearing its end, putting a finger to his lips, he whispered: "Sh! we're there. You'll see lots on 'em, if we don't wake 'em up." A high wall confronted them: looking around, Barnardo could see no trace of life. "Where are they, Jim?" he queried.

"Up there, sir!" The lad pointed aloft.

But to get "up there" meant scaling a wall ten feet high: and how was that to be achieved! Jim solved the problem. Pointing out certain interestices between the bricks, he gripped them with fingers and toes, and in thirty seconds had mounted the wall. Barnardo watched with amazement; how could he follow suit?

His calculations were quickly interrupted. Again the lad's fingers went to his lips.

"Quiet! Sh!—ther' 'ere a' right!"

Jim disappeared, but a moment later was again on the wall. Leaning over and raeching down a stick, he enabled his benefactor to ascend.

Once on the wall Barnardo was dumbfounded.

"There, with their heads upon the higher part, and their feet somewhat in the gutter, but in a great variety of postures . . . lay a confused group of boys on an open roof—all asleep. I counted *eleven*."

"No covering of any kind was upon them. The rags they wore were mere apologies for clothes . . . as bad as, if

not worse, than Jim's. One big fellow, who lay there seemed to be about eighteen; the ages of the remainder varied, I should say, from nine to fourteen."

As the Ragged School teacher gazed upon this spectacle, "the moon, which previously had been obscured, shone clearly out"; and its pale light gleaming upon the faces of those sleeping boys, he realized "the terrible fact that they were all *absolutely homeless and destitute*." But more staggering, the thought haunted him: Are not these boys "*but samples*" of many others, bereft of home or friend? Again he drank in the challenge of the scene, and peering into these pitiable faces, it seemed "as though the hand of God Himself had suddenly pulled aside the curtain" and revealed to him "the untold miseries of forlorn child-life upon the streets of London."

Jim experienced no such emotion: Barnardo's meditation was rudely disturbed:—"Shall I wake 'em sir?"

But to what purpose? Unable to offer help, he dare not rob them of heaven-sent sleep. One thing, nevertheless, he must do. Jim Jarvis he must care for "at all costs." Ere Barnardo descended from that wall, iron entered his blood: the mute appeal of those "upturned faces, white with cold and hunger," burned itself into his soul, where, for weeks on end it was to haunt him until at last he could find "no rest except in action on their behalf."

A final glance, and Barnardo, breathing "a silent prayer of compassion," clambered down the wall, to be met by the interrogation:

"Shall we go to another lay, sir? *Tere's lots more!*" But for one night he had seen enough!

What the spectacle of New Orleans' slavemart was to Abraham Lincoln, "the Emancipator of America's Slaves"; what the spectre of a pauper-funeral at Harrow was to Lord Shaftesbury, "the Emancipator of Industrial England"—*that* the sight of those homeless boys, sleeping on a winter's night upon an iron roof, was to Dr. Barnardo, "the Emancipator of the Outcast Child."

Not yet was Barnardo himself aware of the fact; but, from that hour, the Chinese mission-field was challenged by East London's waifs and strays.

J.W. BREADY, *Dr. Barnardo.*

LORD BADEN-POWELL

It must be remembered that the Boy Scout Movement is not the life-work of Lord Baden-Powell. Before the Movement started he had already had a successful and adventurous career as a soldier. He had won high renown by his heroic defence of the town of Mafeking during the Boer War, and his military abilities were recognized by his appointment as Inspector-General of Cavalry after this war. It was not until he retired from the army in 1910, at an age at which he might justly have considered a leisured life was due to him, that he turned his whole attention and gave all his time to Scouting.

He has himself stated that he did not start Scouting for boys. Though this is true in a very narrow sense, it is also true that he has been its inspiration, and his wise mind its sure guide. What people scoffed at as a fad, for which they prophesied an early end, has grown to be the greatest movement for boys the world has ever known, one which is unique in its international character.



SIR ROBERT BADEN-POWELL STARTS HIS "SECOND LIFE"

THE scheme of Scouting for Boys did not take shape all in a day. It had been gradually evolving itself in B.P.'s mind since he first had men to command, in those early days in India with the 13th Hussars. He had realized then that the ordinary training of soldiers was not practical and did not give them scope for employing initiative in war, nor character for making a success of civil life later on.

In the 13th Hussars, the 5th Dragon Guards and in the S.A.C. he had experimented with what is known as "Scout" training on the men under him; and in Mafeking he had seen how this training was equally applicable to boys, if they were trusted and put on their honour.

On his return from South Africa after the Boer War, B.P. found that his book, *Aids to Scouting*, was being used in boys' schools and in girls' schools also. Since this book had

been written for soldiers, B.P. began to turn the matter over in his mind and find out what it was in it that appealed so strongly to children, and he then set to work to rewrite it as a book for boys.

The following extract from a letter received in 1900 is worthy of record:

"My two cousins and I have a B.P.S.S., that means Baden-Powell Scouting Society. We have had one try at it; it is hard to keep behind bushes without being seen and we get horribly thirsty."

I hope—and expect—that the writer of that letter is a prominent Girl Guide to-day!

In 1906, B.P. sent an outline of his scheme of "Scouting for Boys" to the leading members of boys' movements, and of the Army, Navy, Church and State, and the replies and comments which he received were all so encouraging that he was urged to go on with it.

Lord Roberts was one of the first to express approval of the scheme.

"I like the idea and I think it may have good results. Boys are very receptive and would enjoy the delights of such training if it were carried out in a satisfactory manner. Good instructors would be needed and I suppose a certain amount of financial assistance would be required. I am sure it would be better for the boys to spend a day in bicycling in the country near the large towns and learning to Scout, than to waste their time—as so many of them do—in looking on at games in which they are not sufficiently skilled to take part themselves. I hope your scheme may be given a fair trial."

When the Boy Scout Council was formed some years later, Lord Roberts was one of its first members.

In 1907, Baden-Powell lectured on his Scouting scheme at many big centres, including Rhondda, Swansea, Cardiff, Radcliffe, Hereford, Exeter, Darlington, Glasgow and Malton—and the same year he conducted an experimental trial Scout camp at Brownsea Island, Dorset. Here he set the boys to work, for the first time, under the Scout Law and what we now know so well as the "Patrol System," i.e., boys working under a boy leader. The boys had a glorious time and rose above even the expectations that the Chief Scout had had of them, so the experiment was an undoubted success.

1908 opened with the publication of the now world-famous handbook, *Scouting for Boys*, in six fortnightly parts. Before the series was half completed, troops of Scouts had sprung up like mushrooms all over the kingdom. With the help of the late Sir Arthur Pearson, himself a lover of boys, B.P. was able to get his scheme into working order and he started a weekly newspaper, *The Scout* (some of you know it, I think!), by means of which to keep in touch with the youthful band of followers who were now looking to him for a lead. These were not in England only, for the Scouting fever had spread to other parts of the Empire as well, and the game of Scouting was demanding guidance and administration.

The uniform of shirt, shorts, scarf and cowboy hat was that which B.P. had worn himself on service, and which he had found more serviceable than anything else. The S.A.C. had adopted it, and it became automatically the uniform of Boy Scouts, since it was in that kit that B.P. was known to his hero-worshippers.

He was still in the Army and was at that time in command

of a Northumberland Territorial Division, so that it was only his spare time that he could devote to the boys who looked on him as their leader.

1909 saw the first big rally of Boy Scouts, which was held at the Crystal Palace and attended by 11,000 boys. Scotland was not far behind, and they held a rally the same year at Glasgow, when 6,000 Scouts, wearing the kilt instead of shorts, gathered to meet the Chief. A new book of *Scouting Games* was forthcoming from B.P.'s pen in 1909.

In that year also another training camp was held at Bucklers Hard and on Mr. C. B. Fry's naval training ship *Mercury*; and here Sea Scouting may be said to have been inaugurated.

That same year he was knighted by King Edward. Writing from Balmoral Castle, on Sunday, 3rd October, 1909, he said:

"I came on here this morning by the King's mail train to Ballater, Royal carriage and pair met me there, and here I am. I have had a long walk and talk with Mr. Haldane and am to see the King presently when I have dressed for dinner. Haldane has hinted to me that the King is going to make me a K.C.V.O.

P.S. (later).—Just before dinner the King sent for me. The equerry, Colonel Legge, took me to his (the King's) room, and while outside the door took off my miniature medals and pinned two safety-pins on the outside of my coat and ordered a footman to take in a cushion. It was like preparation for an execution! Then we walked in. The King in Highland costume shook hands and told me that for all my past services and especially my present one of raising Boy Scouts for the country he proposed to make me Knight Commander of the Royal Victorian Order. Then he sat down and I knelt in front of him, the equerry handed him a sword, he tapped me on each shoulder, then hung the cross round my neck and hooked the star of the order on my coat and gave me his

hand to kiss, and then told me that his valet would put the ribbon right for me and off I went.

Then after dinner he called me up and asked me all about the Scouts and talked about them for over half an hour, and suggested that I should bring them to Windsor Park for him to see in the summer."

In this conversation, King Edward cordially agreed to the suggestion that Scouts who proved themselves exceptionally good should receive the title of "King's Scouts."

King Edward had been one of the first to see possibilities in the Scout movement, and his death in 1910 was a great sorrow to B.P. King George at once became Patron, and in 1911 he inspected 33,000 Scouts in Windsor Great Park.

In addition to his weekly talk to Boy Scouts in *The Scout*, the Chief was also now writing month by month in the *Headquarters Gazette* (now the *Scouter*) words of guidance and direction for the men who had come forward in response to his call to lead the boys in their Scouting. Mr. H. G. Elwes, who had been for many years a devoted worker among boys, became editor of this journal in its early days and was also an original member of the Boy Scout Council.

Sir Edmand Elles became Chief Commissioner and B.P.'s right-hand man in the organization of the movement; and it is thanks to him that the Boy Scouts Association now has its Endowment Fund.

It is thanks to the help of these far-seeing men, and thanks most especially to the self-sacrificing work of the first Scoutmasters (that gallant band who took their boys to Windsor in 1911), that the Chief Scout was able to give this great education in citizenship to the boys of the world.

In 1910, B.P. saw that if the Boy Scout brotherhood were

to develop on the lines which he had worked out (it now numbered 123,000) it must become for him a "full time job." He had the faith and vision to realize that—even though it might mean the end of his own career—he could do more for his country by training the rising generation to be good citizens than by training a handful of men for possible future fighting. So after more than thirty years of soldiering—during which he had drunk to the brim of adventure, hard work and well-earned honour—Baden-Powell retired on to the Reserve with a reward for good service, a brilliant past to look back upon, and still young enough to embark on what he describes as his "second life."

If you ask him which of his two lives he has enjoyed the most, the Chief Scout will smile, but he will not commit himself.

The life of a cavalry officer and the life of Chief over the Boy Scouts with their aim of world-wide peace and good citizenship would seem at first sight to have little in common. But look again.

"Train your Scouts as individuals and then harness that individuality for the good of the whole" is one of the Chief Scout's maxims, and he does not preach what he has not practised.

During his soldiering career he had fitted himself by practice, travel, hard work and experience to be a leader of youth. Having seen at first hand the horrors of war, he is also in a better position than any pacifist to promote peace.

It has sometimes been urged that with a General at its head the Boy Scout organization cannot be other than military.

The Chief's reply is that there is no reason why an old

circus horse, having finished his career in the ring, should not settle down peaceably to the useful civil occupation of pulling a baker's cart.

Party politics have never had any attraction for Baden-Powell; they are, he says, too strong for his palate—where you have to put party before conscience or country.

When, after the South African War, he was invited to stand for Parliament, he could not resist sending the following reply to Lord Roberts' telegram—"Delighted—which side?"

A free man at last, B.P. set himself enough work to keep him more than busy for the rest of his life, and went off to Canada, where Scouting had been keenly taken up and was in need of some help in organization.

He took with him two patrols of typical Scouts selected by competition from troops at home, in charge of Mr. Eric Walker, his staff officer, and Captain A. G. Wade, then Scoutmaster of the 1st Chichester Troop. These Scouts toured Canada, giving demonstrations of pioneering, tracking, camping, cooking and other Scouting activities to illustrate the lectures which the Chief Scout gave in the principal centres.

America was also "biting" at Scouting—and the story of how they came to adopt the training is worthy of record here.

A rich American was walking in London when a boy came up to him and offered to carry his bag. To the American's astonishment he flatly refused to accept any reward for doing so, explaining that he was a Boy Scout and could not accept tips.

On thinking it over, the American came to the conclusion that there must be something in the spirit of a movement which made an obviously poor boy refuse what would be to him a handsome sum of money. He bought a copy of *Scouting for Boys* and returned to America determined that young America should have Scouting too.

Scouting for Boys, published in volume form in 1908, had had an extraordinary reception not only in the British Empire and America, but from foreign countries also applications for permission to translate it were flowing in.

President Roosevelt wrote:

"I most cordially sympathize not only with the methods of the book but perhaps even more with its purpose for, of course, with very trifling changes of language, the lessons which it teaches are as applicable to and as necessary for young Americans as young Englishmen. If the next generation grows up to be wishy-washy, to lack patriotism, and neither to have nor to admire the sterner virtues, the outlook will be indeed gloomy, and I think that mere frivolity—mere love of cheap excitement may do as much damage as corruption. Moreover I quite agree with the lesson of this book that ordinary athletic sports, excellent though they are, do not take the place of life in the open as you teach it."

From Canada, a year later, Lord Grey (the Governor-General) wrote:

"The Scout movement is putting new ideals and a new religion into the boys of Canada."

About this time also, Sir William Smith, one of the great "boy experts" of the world, and founder of our great brother movement, the "Boy's Brigade," wrote to B.P.:

"May your wonderful creation continue to flourish for many years to come, and be a source of inspiration and pleasure to the boys of all the earth."

This was all very encouraging.

The Duke of Connaught—who had always taken a fatherly interest in Baden-Powell and his schemes for training—became first President of the Council which was formed in 1909 to administer the movement.

"The Boy Scout movement," he said, "works on the best side of our youth and brings out all that is good and manly in them and teaches them to do things for themselves."

1911 saw B.P. appointed Hon. Colonel of his original regiment, the 13th Hussars.

The same year marked a big step in the Boy Scout movement. The King inspected the greatest gathering of boys ever seen—33,000 Scouts in Windsor Great Park.

E. K. WADE, *The Piper of Pax.*

SIR RONALD ROSS

MANY students of medical research had given their attention to the cause of malaria fever before Sir Ronald Ross began to investigate the problem. When in 1890, as a doctor in the service of the Indian Government, he began this work, it was known that malaria was caused by parasites in the blood. But how these were conveyed from the sick to the healthy was not yet discovered, although some students thought, but had no proof, that mosquitoes were the carriers.

For four years Ross made small progress with his researches. But in 1894, when he was on furlough in England, he met Dr. Patrick Manson, the foremost authority on tropical diseases. Manson encouraged Ross in his work, and with his experience and fertile mind suggested new lines of investigation for Ross to take up on his return to India.

For another four years Ross worked on, despite official neglect, inadequate facilities and enervating climate, and in July 1894 he was able to wire Manson that the problem was solved.

No discovery of recent times can be more important than this made by Ross, none can have benefited more of mankind. Whole areas of the world, where before man lived miserably under the curse of this disease, have become healthy and prosperous. His discovery made possible the construction of the Panama Canal; through him the West Coast of Africa no longer can claim the dread title of the White Man's Grave.

SIR RONALD ROSS SOLVES THE SECRET OF MALARIA

To solve the malaria problem was now the master purpose of Ross's life. For it he was sacrificing all comfort and leisure, all lesser satisfactions, impoverishing himself and risking health. For some time now he had cherished the hope that the Indian Government might be induced to second him for special duty on malaria investigations, and had made suggestions in certain quarters. Sir Patrick Manson also considered this the right policy, and used his own influence in high places in London. In the summer of 1897 he wrote this to the India Office:

"To our national shame be it said that few, very few of the wonderful advances in the science of the healing art which have signalized recent years have been made by our countrymen. This is particularly apparent in the matter of tropical diseases in which we should, in virtue of our exceptional opportunities, be *facile princeps*. But even in tropical diseases Frenchmen, Italians, Germans, Americans, and even Japanese are shooting ahead of us. We have to get a Koch to find for us the cholera germ, and a Haffkine to protect us from it, a Laveran to teach us what malaria is, a Kitasato to show us the germ of plague and a Yersin or a Haffkine to cure us of its effects . . . But in this matter of malaria here is a chance for an Englishman to rehabilitate our national character and to point out to the rest of the world how to deal with the most important disease in the world—malaria" (quoted in Ross's *Memoirs*, p. 217).

But a bureaucracy moves to unaccustomed ways with difficulty. Inevitably it prefers to keep to its own procedure and routine. It is possible even for doctors who are also officials to become tied to the official machine, which offers few facilities to enterprise. Some excuse may be offered for medical administrators who fail to keep abreast of the results of research, and forty years ago preventive medicine had hardly the place it now holds in professional attention. Men like Manson and Ross were pioneering in the field of tropical medicine, and it is the lot of such to be regarded by many with scepticism, and dismissed by others as cranks. But there was less excuse for indifference to their work. To a man of Ross's temperament, whose researches had reached the point they had, the official attitude was exasperating.

Persistent pressure, however, at last won, and in January 1898 Ross was notified that the Government of India sanctioned his appointment to special duty. Seventeen days later he "departed from that melancholy exile (in Kherwera) with a light heart and two bottles full of mosquitoes." Upon reporting to the Director-General of the I.M.S. in Calcutta, Ross found that he was to investigate not only malaria, but kala-azar.

Kala-azar is a Hindustani name, meaning black sickness. The disease is a fever, not intermittent like malaria, but chronic, which reduces its victims to extreme emaciation and a long-drawn death. "Whole families, villages, and coolies' quarters were affected," wrote Ross, "and it was a dreadful sight to see the poor wretches, nothing but skin and bone, with enormous abdomens, children and adults, trying to keep alive by lying in the sunshine—and death was then

almost inevitable. It is sights like these which make the medical investigator." (*Memoirs*, p. 318.)

Ross was given a laboratory consisting of two rooms, offices and a veranda, known as "Cunningham's," after the official investigator who had previously used it. With the laboratory went an Indian assistant and a "durwan," both old men; so Ross engaged two assistants, Mahomed Bux and Purboona, whom he paid eight rupees a month—out of his own pocket.

Mahomed Bux is another whose name is not to be forgotten in the story of the conquest of malaria. "I chose him," said Ross, "out of about twenty applicants because he looked the most rascally of the lot and was therefore likely to have considerable intelligence!—and right well he served me. Later on he knew every bird and every mosquito and gave Indian names to some."

Not a little now depended upon what mosquitoes could be found in Calcutta. Ross soon discovered that grey mosquitoes were commonest, the brindled rare, with a few black or grey dapple-winged, which swarmed in a drain conveniently near Cunningham's. He renewed his experiments, paying boys to collect grubs, and flooding some ground at the laboratory to imitate a rain-puddle. Another difficulty was the comparative scarcity of malaria cases in Calcutta. Ross therefore turned to the study of malaria in birds. Ten years earlier, after Laveran's discovery of *Plasmodia* in human blood, a Russian investigator, Danilewsky, had found similar parasites in birds, and one or two others had given some attention to avian parasites. So Ross began to watch crows, sparrows, larks and pigeons that had been exposed to mosquitoes. The birds were set

in cages upon two old hospital beds on the veranda, under mosquito nets, into which larva-bred mosquitoes were liberated at night. Mahomed Bux slept on the ground between the beds to keep cats away. Ross found that the mosquitoes fed on the sleeping birds by creeping under their feathers. Before many weeks Ross was able to report parasites in the crows and pigeons, and pigmented cells in grey mosquitoes that had fed from their blood. A few days later: "I am producing pigmented cells *ad libitum* by feeding grey mosquitoes on larks infected with *proteosoma*. This, of course, means the solution of the malaria problem." There follows a detailed description, daily notes of progressive results of these experiments.

Ross watched the cells grow up to eighty-five hours. "I have," he writes to Manson, "only to find sporulation to complete the life-history. Then I shall wire to you." The difficulty was that most of the mosquitoes died about eighty hours after feeding. A week later, though he had not found sporulation, he wrote that there was no doubt that he had succeeded in cultivating *Plasmodia* in the mosquito. He noted how the cells corresponded in size and appearance with the time after feeding. It was clear that the growth of the cells began at the moment of feeding, and not before. Neither did it begin after feeding, because young cells were not found in mosquitoes kept for three or four days without a second feed. Further, in mosquitoes fed a second and third time from infected birds, each feed was followed by a new crop of pigmented cells, "so that we may have two and even three generations proceeding in their growth side by side in the same mosquito. This proves conclusively that

the origin of the cells depends upon the feed of blood" (30th March, 1898).

A further point established was that the parasites became fully grown in the mosquito's stomach on the sixth day after it had fed upon infected blood, and was then extruded from the stomach. What happened to it then?

Another experimental test led to an important conclusion. Examining the blood of three sparrows, Ross found one quite healthy; another contained a few parasites; and the third many. Each bird was put under a separate net and exposed to mosquitoes caught in the same drain and hatched out in the same bottle. These were the results: In fifteen mosquitoes fed on the healthy sparrow not one parasite was found; of the nineteen fed on the second, every insect contained some; of twenty insects fed on the third, every one contained some, and some contained swarms of parasites. These results Ross formulated in a law: The number of *coccidia*¹ in the mosquito is proportional to the number of parasites in the blood of the bird. To Manson he wrote: "What a beautiful discovery this is! I can venture to praise it because it belongs to you, not to me. I sometimes think it is the prettiest thing in the whole range of pathology. How simple it all is after all! I think that something funny occurs on the seventh day; hence the complete life-history may not be found all at once. Of course its discovery implies the solution of the malaria problem. . . . I shall not wire to you until I find the complete life-history . . ." (5th April).

¹ The term *coccidia* was here used to signify the malaria parasite at this stage.

In May of that year Ross wrote a report on his work for the medical authorities in India, in which he described the cultivation of *Plasmodia* of birds in the mosquito *Culex fatigans* up to the maturity of the zygotes. In a covering letter he claimed that "full proof has at last been obtained, after three years' investigation, of the mosquito theory of malaria." He begged earnestly for assistance, or for release from the work on kala-azar, if only because of the severe strain upon his eyesight. Both requests were refused.

At the same time Sir Patrick Manson published an abstract of Ross's work,¹ partly to place on record Ross's claims to priority in discovery. The paper quoted these words from a letter written to Manson by M. Laveran: "The discovery of Dr. Ross appears to me, as to you, to be of very great importance. . . . I have shown the preparations to M. Metchnikoff, who shares my opinion." Just previously Ross had written in a letter to M. Laveran:

"Will you permit me to conclude with an expression of satisfaction that after three years' labour I am at last able to make this announcement to you, who not only originated our correct knowledge of these subjects, but from the first divined that the mosquito is connected with the propagation of these parasites."

Ross's report also paid tribute to the inspiration and constant advice of Manson. Years later Ross wrote: "I was and am a heroworshipper, and he and Laveran were my heroes. He, almost alone, had helped me in the long fight, and I swore to give him all the credit I may have

¹ *British Medical Journal*, 18th June, 1898.

acquired in return. So! Let the cup of gratitude spill over rather than be stinted.”¹

“When I returned to Calcutta I knew that it was the last stage of the great battle—the decisive victory.” And Ross’s natural eagerness was spurred by the fact that the British Medical Association was to meet at Edinburgh that July, with a new section devoted to Tropical Medicine, of which Manson was to be first President. Ross’s ambition was to complete his life-story of the *Plasmodium* in time for that meeting. The history had been traced down to the zygote, the fertilized female cell. The next stage must be sporulation, that is, the zygote must release free cells capable of individual development—the mother must send forth her offspring to live their own life.

The experiments went on, and suggested what happened. It looked as if, about the seventh or eighth day, the zygote burst in the living insect.

“Nature probably makes some extraordinary effort here in order to complete the life-cycle. What the dickens she is going to do next I cannot imagine at all. . . . But this climate! I can perhaps stand another month of it. It is hell, simply; and the constant strain on mind and eye at this temperature is making me thoroughly ill . . .” (to Manson, 28th June).

In a salt solution the zygotes appeared to be striped or ridged, and this, thought Ross, must be because they were packed with curved, needle-shaped bodies, which he called “germinal threads” or “rods.” These, when the mature zygote burst, were released into the mosquito’s belly. What exactly were these “germinal rods”? On 29th June Ross

¹ *Memoirs*, p. 288.

found some of them in the thorax of two mosquitoes. What were they doing there? He then found that they were often more numerous in the thorax than in the abdomen. "I went at mosquito after mosquito, spending hours over each, until I was blind and half-silly with fatigue. The object was to find if possible a place or structure where the rods accumulate; or to discover some further development in them."

On 4th July Ross made a momentous discovery. Near a mosquito's head he found "a long branching gland . . . looking like a coil of large intestine, and consisting of a long duct with closely packed refractive cells attached to it," and this gland was full of the germinal rods. But what was this gland? Examination of more mosquitoes showed that the duct led into the insect's head. "In other words, it is a thousand to one it is a *salivary gland*." Ross now felt almost entitled to postulate, tracking the parasite stage by stage, that "malaria is conveyed from a diseased person or bird to a healthy one by the proper species of mosquito, and is inoculated by its bite."

A week later, after more dissections, he described to Manson the anatomy of the gland, tracing the ducts into the long stabbing spears of the proboscis. "There is no doubt then that the gland must pour its secretion straight into the wound made by the mosquito." The chain of evidence, pointing to infection whilst the female mosquito was drinking, seemed complete. The story was told.

It was clinched when Ross could show detailed proof: a number of mosquitoes, infected from malarious sparrows on 21st to 22nd June (the identical stock with which he had worked out the story of the germinal rods), were allowed to

feed four nights later from proved healthy sparrows. Within a fortnight the blood of these birds was swarming with *Proteosoma* (parasites of bird malaria). This proof was several times verified.

➤ Characteristically, Ross offered Manson eager congratulations: "The door is unlocked, and I am walking in and collecting the treasures"—and confessed: "I have become unbearable with conceit over tracking the germinal rods into the salivary gland. That was a grand charge. I brag openly about it! . . ." Ross's one desire now was to work through the cycle with human malaria. And now he could begin to anticipate some respite and "a sniff of cold." In his next letter (20th July) he announced the law: "Healthy birds may be infected by the bites of the proper species of mosquito which have previously fed on diseased birds."

This appeared finally to put out of court the theory that malaria might be contracted through water or dust containing dead mosquitoes. What, asked Ross, was a dead mosquito in water or dust? It was infinitesimal. "Men and birds don't go about eating dead mosquitoes. No, Nature is too clever. . . . She brings the mosquito (and the infection) straight to the man or bird and puts it nicely into his blood, so as to give it every chance."

Ross had discovered the mode of infection. It was now to be announced to the world. On 25th July Ross wired to Sir Patrick Manson reporting a complete solution of the problem of malaria infection. At the B.M.A. meeting, at Edinburgh, on the 28th, Manson delivered his address on "The Mosquito and the Malaria Parasite." It was a masterly account of Ross's work, describing the full life-cycle of *Proteosoma* (avian *Plasmodia*, and therefore

presumably of all *Plasmodia*) in mosquitoes, with the collection of the probospores in the salivary glands and the experimental infection of healthy birds. Manson's account, particularly when he read out Ross's telegram, made a real sensation in that company of sober medicos.

But did Ross's discoveries completely cover the life-history of the malaria parasite outside the human body? He had found something unsuspected either by Manson or himself, namely, that mosquitoes are not only infected by biting infected birds through the route of entry (as Manson had suggested), but in their turn infect healthy birds through the route of exit and the salivary or poison glands. Manson was doubtful whether a mosquito's bite was the only way by which malaria was communicated. Therefore, it seemed to him, there must be another phase of life. Could man-to-mosquito, mosquito-to-man be the whole story? Manson suspected an infection of mosquito by mosquito. But he was quite convinced that all that Ross had proved concerning avian malaria held good for human malaria.

Ross summarized the results of his researches thus: *Zoologically*, the law of Alternation of Host (Metaxeny) had been proved to apply to unicellular parasites; and *epidemiologically*, it had been shown that malaria infection came, not from drinking water, nor from inhaling marsh air, but from injection into the blood by the mosquito's bite.

"Nature," he wrote, "was more resourceful and astute than all of us. She did not spill the germs broadcast through the soil, water and air, as we had supposed; she put them directly into man from the mosquito and into the mosquito from man! And this would render more instant and exact the means of preventing the greatest of diseases." The entry

of the "germinal rods" into the mosquito's salivary glands he considered "a most wonderful and beautiful case of natural design."

As to his own feelings, he took to himself the young John Keats' lines, "On First Looking into Chapman's Homer":

Then felt I like some watcher of the skies
When a new planet swims into his ken.

"Such moments come only to one or two persons in a generation. The pleasure is greater than that given by any triumph of the orator, the statesman or the conqueror; for the end attained does not lie in some petty intertribal advantage, but in a benefit conferred upon all men, and, not only for to-day, but for all time—at least until 'The future dares forget the past.' The triumph of 20th August, 1897, was now completed and crowned by that of 9th July, 1898—more than enough to compensate me for all my toils." (*Memoirs*, pp. 309-10).

He had now reached a point where several new lines of study began, and he was eager to attempt them all. But, for the third time, he was called away from malaria, this time to the study of kala-azar. So "on the morning of 13th August Mahomed Bux and I released all our poor little feathered prisoners. . . . May their little souls be living for ever among eternal flowers and berries in some avian heaven. Mahomed, who had given names to most of them, looked almost sad as they departed." (*Memoirs*, p. 313).

J. O. DOBSON, *Ronald Ross, Dragon Slayer*.

LORD BIRKENHEAD

By his brilliance and audacity F. E. Smith, Lord Birkenhead, fought his way to the highest offices in the State. Scholarships took him to Oxford, where he had a distinguished career, and where he remained for a few years as a fellow and lecturer. His subject was law, and he left Oxford to practise it. He had already made a reputation for himself as a skilful and forceful advocate, when he determined to make politics his career. He became a member of the House of Commons in 1906, and twelve days after the House assembled made his maiden speech. He determined that this speech should be of such a nature that, should it win approval, his reputation with his party would be made in a night, but he realized that, should it fail, his hopes of political advancement would be shattered.

His decision cannot be dismissed as a gambler's throw; he chose his moment well, he gave his speech great thought and most careful preparation, and his faith in himself enabled him to face the ordeal with complete self-possession.

His speech succeeded beyond his hopes, and started him on a career that was finally to place him in the chair of the Lord Chancellor of England.

LORD BIRKENHEAD MAKES HIS MAIDEN SPEECH

- ▶ TWELVE days elapsed between Smith's first question in the House on March 1, 1906, and his maiden speech, twelve days, during which, exercising great self-control, he had listened to the exultant platitudes which fell from the mountain on the other side of the House. It was still, in 1906, an accepted tradition that a new member should first suffer under the eloquence of others before addressing the House, and, when he did so, should preface his remarks with a plea for indulgence. This convention would have applied particularly to a young and unknown member of the discredited Opposition.

- ▶ Maiden speakers in the House of Commons are deterred by an incalculable quality in the audience, and success in Parliament cannot safely be predicted for the most brilliant speaker. Some of the most effective voices of the platform have fallen upon indifferent ears in the House of Commons. Rounded periods and classical quotations died with Gladstone; mere rhetoric is not enough. Men whose forensic eloquence has charmed juries have found themselves speaking to a House of Commons buzzing with animated conversation. Erskine and Russell, two of the most superb advocates at the English Bar, were doomed to a swift and absolute parliamentary failure.

F. E. Smith was convinced that he could master that difficult House, for he was clairvoyant with an audience. His speaking had no rigidity—he could withdraw the unpalatable in a moment, and sense what was desired. Few

men of his age could have studied oratory more deeply than he, or applied the lesson more profitably to their own case. In fact, oratory and the law were the two subjects on which he had lavished most reading and attention. The descriptive genius of Macaulay, the corrosive irony of Gibbon, Bright with his limpid periods freshly quarried from Milton and the Bible, the beautiful simplicity of Greek eloquence, Demosthenes, and that funeral speech placed in the mouth of Pericles by the genius of the greatest of Attic historians, Cicero's sweeping perorations, the astounding precocity of Fox, the speeches of Pitt, Burke, Gladstone, Disraeli—he had studied them all, and tried to learn from each the secrets of their art.

He had sat for some time, sensing the unfamiliar atmosphere, and declining to make a premature entry into debate, for blended with daring there lay in him a deep vein of prudence and circumspection. He was biding his time. When he sat looking round at the House, he saw beside him a little group of one hundred and fifty Conservatives: they were listless and dispirited, and the enormous majority seemed to weigh upon them like a thundercloud. The Liberal majority was exultant; out of power and place for so many years, they returned full of insolence and resolved that the result of the election was a mandate for the whole of their policy, including Free Trade, Home Rule, House of Lords Reform, measures for education, restrictions for licensing, and Welsh Disestablishment.

F. E. waited impatiently for a suitable moment to intervene. At length on March 12 it came. Sir James Kitson, a Yorkshire Liberal, moved a resolution in a con-

ventional and boring speech, recording the satisfaction of the House that the country had recorded an unqualified verdict in favour of Free Trade. The debate was limited to a single day: during the course of that day the House was crowded to suffocation, although when Smith rose to speak many members had gone out, only to hurry back when they heard shouts of laughter. Everybody wanted to speak, and it was extremely difficult to obtain an opportunity. Smith approached Joseph Chamberlain in the lobby, and reminded him of his promise, asking him if he would influence Mr. Speaker in order that Smith might be called upon. He willingly agreed to do so, and when he came back he told Smith that he would be called upon at ten o'clock, the best hour of the debate. "This is the chance of your life, my friend," he said, "see that you use it."

But Smith had no intention of squandering this opportunity. Departing from habit he had prepared his speech, learned it by heart, and polished it into epigrammatic perfection.

In his excitement he forgot to ballot for a ticket in the ladies' gallery for his wife, but she was dining with Mr. Horridge, the Liberal who had unseated Balfour in Manchester. He had a ticket to spare, and gave it to her.

F. E. Smith and she drove down to Westminster together. Mrs. Smith was terribly nervous. Smith was impassive and silent. Suddenly he told her that he had resolved to stake all upon this speech, and to attempt a dazzling gamble, so that it would either prove an amazing success or a failure more shameful than Disraeli's maiden speech. "If I fail," he added, "there will be nothing for me but to remain

silent for three years until my disgrace is forgotten." "Must you risk so much?" asked Mrs. Smith anxiously; but his mind was made up.

They entered the House, and Mrs. Smith went up at once to the ladies' gallery. Mr. Philip Snowden, the best orator of the Socialist Party, made his maiden speech directly before Smith. As he rose, members found themselves looking at a face of great interest, a pale ascetic face with sharp features, and a high intellectual forehead, as an observer noted: "a youthful edition of Cardinal Manning." He was clearly nervous, but his speech from the Socialist point of view was excellent. Though admitting himself to be a Free Trader he confessed that sixty years of Free Trade had failed to ameliorate the conditions of the working classes, and members were amused by his references to "these useless and unnecessary landlords." He employed none of the hackneyed arguments against tariffs, cocked no common fiscal blunderbuss. One of his arguments was that our products would easily triumph over foreign duties, if it were not for "these useless and unnecessary landlords" with their mining royalties, but the satisfaction which Ministers felt at this part of his speech yielded to annoyance when he went on to propose Socialist legislation. But it had been a good speech; he had made his points well, and thrust them home with determination, although his voice was metallic and his wealth of gesture a little luxuriant.

Then the Speaker called upon Mr. Frederick Smith to address the House. Smith was sitting just behind the Front Opposition Bench on which Mr. Balfour and Mr. Chamberlain were apathetically lounging. He rose to his feet: he

was tall and slim, with coal-dark hair, the colour of which seemed to emphasize the pallor of his face—hair oiled and smoothed into an almost Latin brilliancy. The cheek-bones were high, the mouth contemptuous, with that short upper lip which lends venom to the smoothest sentence: the figure lithe and perfectly dressed, the eyes black and tired, the appearance languid. The clinging coat-tail culminated in a gay buttonhole, and a tall collar. The dark eyes and the scornful mouth held not the slightest expression. T. P. O'Connor had been observing this young man for several weeks, and said: "They might have been the eyes of a man who had watched with sleepless though furtive vigilance all the great drama that was being unfolded in that astounding new House of Commons, or they might have been just beautiful and shallow eyes that concealed no depths, because there were no depths to conceal. He stood for a moment aloof and silent, and the eyes retained their strange look of sombreness; on his face was a look of supreme boredom and contempt."

He looked like a young man of fashion who had wandered into the House on his way back from Ascot. He was thirty-three, but he looked far younger. Even the members of his own party had for the most part not the slightest idea who he was, or suspected that from him there were, in a moment, to pour forth cascades of satire in shooting lime-lit jets. He did not betray the slightest nervousness, but thrust his hands into his pockets and leaned with easy informality over the heads of the men in front of him. He surveyed the packed Liberal benches with sneering mouth and an expression of profound distaste.

The Conservatives, seeing this unknown youth rise at such a moment, uttered murmurs of surprise and dissatisfaction. "Who is this boy?" they asked; "haven't we got anyone better?"

When the Speaker called the name two men had risen simultaneously, for there were two Frederick Smiths in the House. F. E. Smith turned, and waved his rival down, but he refused to give way. Then the Speaker said, "This Mr. Frederick Smith," indicating F. E., and the other sat down.

It was an unpromising beginning, and the House was restive; but he began to speak in a clear, vibrant voice, as a witness said, "directing his voice straight on his lips, making the articulation extraordinarily distinct." It was a charming voice, a rich but resonant whisper. He turned the phrases on his tongue as though he was tasting some rare bouquet. Mrs. Smith moved nervously in the gallery as the familiar voice began. There was no particular rise and fall about the voice; the lips made what variations there were, and the diction was perfect. When he had spoken for a little while, the House stirred, and he possessed it. His listeners missed the appeal to their indulgence, for he considered that the request for indulgence could only come gracefully from lips that made a modest uncontroversial appeal, and he did not intend to make such an appeal. He began an acid attack on the Government, and the methods by which it had won the election. Every sentence held the sting of an adder, but the speaker himself remained absolutely impassive, and the roars of laughter which greeted his gibes brought not the flicker of an answering smile to the look of weary contempt on his face.

He began by a criticism of Mr. Snowden's predatory proposals at the expense of those who owned land, and said:

"When I hear vague and general proposals put forward at the expense of large incomes, without any precise explanation as to the principles upon which, or the extent to which, those incomes are to be appropriated or tapped for the service of those who are less fortunate, I should like to make an elementary observation, that there are very few members of this House, whether in Opposition or on the benches opposite, whose principal business occupation it is not to provide themselves with as large an income as they possibly can."

"All great political parties," he continued, "have skeletons in the cupboard, some with manacles on, some with their hands tied behind their backs.¹ The quarrel I have with hon. gentlemen opposite is that they show an astonishing indelicacy in attempting to draw our skeleton into the open: not satisfied with tomahawking our colleagues in the country, they asked the scanty remnant in the House to join in the scalp dance."

He turned on Mr. Austin Taylor who had stood as a Conservative candidate for the East Toxteth Division of Liverpool at a by-election in November 1902, and had been elected. At the general election of 1906, he stood as a Unionist Free Trader, and was returned unopposed. Soon after Parliament assembled he crossed the floor of the House, and had since remained a supporter of the Government:

"We were particularly pleased," continued Smith, "with the remarks which fell from the hon. member for East Toxteth, for he entered the House, not like his colleagues on the crest of the wave, but rather by means of an opportune dive; everyone in the House

¹ A reference to Liberal propagandist cartoons depicting the Chinese coolies.

will appreciate his presence, because there can be no greater compliment paid to the House than that he should be in our midst when his heart is far away, and it must be clear to all who know the hon. member's scrupulous sense of honour, that his desire must be at the present moment to be among his constituents, who are understood to be at least as anxious to meet him."

There came a shout of laughter, as sweet as nectar to the speaker, but his features did not relax in the slightest from that look of fixed scorn. Mr. Balfour's apathy fell from him, and he rolled about on the Front Bench in delight, Mr. Chamberlain's austere mouth melted into a broad grin, and Sir Edward Carson was so happy as to look "almost human."

Then Smith took the words of the resolution, and made successful play with the word "unqualified" which had been used in it.

"In the first place we are asked to recognize the merits of what is described in an obscure prescriptive principle as Free Trade, and in the second we are invited to register the proposition that the country gave an unqualified verdict in its favour. The word 'unqualified' is in itself ambiguous, and may have more than one meaning. If we say that a man is an unqualified slave, we mean that his condition can honestly be described as completely servile, and not merely semi-servile. If on the other hand we say that a man is an unqualified medical practitioner, or an unqualified under-secretary, we mean that he is not entitled to any particular respect because he has not passed through the normal period of training or preparation. It is, on the whole, probable that the word is used in the first sense in the present motion. But perhaps it is necessary to distinguish even further. When hon. gentlemen opposite are successful at the polls it is probably used in the first sense. In the comparatively few cases in which I and my friends were successful it is used in the second."

Then his satire flickered like a flame through the Liberal benches. First he disposed of Herbert Paul, the "Second Asquith" and the wit of the Liberal back-benches, who had described protection as a "rotten stinking carcase."

"Hon. gentlemen opposite are, in fact, very much more successful controversialists than hon. members on this side of the House. It is far easier, if one is a master of scholarly irony, and a charming literary style, to describe protection as a 'rotten stinking carcase,'¹ than to discuss scientifically whether certain limited proposals are likely to prove protective in their incidence."

Then he shot at an antlered stag.

"It is far easier, if one has a strong stomach, to suggest to simple rustics, as the President of the Board of Trade did, that if the Tories came into power they would introduce slavery on the hills of Wales."

Mr. Lloyd George jumped to his feet in a dead silence, and gave a furious thump on the dispatch box and said angrily: "I did not say that!" Members looked at Smith, expecting him to be crushed by this denial, but he went on coolly:

"The hon. gentleman would no doubt be extremely anxious to forget it, but, anticipating a temporary lapse of memory, I have in my hand the *Manchester Guardian* of January 11, 1906, which contains a report of his speech. The right hon. gentleman said: 'What would they say to introducing Chinamen at 1s. a day in the Welsh quarries. Slavery on the hills of Wales! Heaven forgive me for the suggestion.' I have no means of judging how Heaven will deal with persons who think it decent to make such suggestions."

¹ A phrase used by Herbert Paul.

There had never been such a score over a Cabinet Minister by a maiden speaker; the Opposition rocked with delighted laughter at Mr. Lloyd George's discomfiture, and at the ready retort which had silenced him.

Then Smith sent a shaft in Mr. Churchill's direction:

"Did the hon. member, the Under-Secretary for the Colonies, use his great and growing influence on behalf of what he knew in his heart to be the truth? I say 'on behalf of what he knew to be the truth, because the hon. member is reported in the *Manchester Guardian* as having said on January 12, 1903, that he was quite sure that supplies of native or Chinese labour would have to be obtained for the mines in the interest of South Africa as a whole. I will not weary the House with the whole of the Under-Secretary's peroration. I think it has been at the disposal of both parties in the House, before undertaking a provincial tour. Mr. Speaker, it is easy for the Under-Secretary to come to the House and state in the debate on the Address that he attempted to confine the issue at the election to the single point of Cobdenism, to the single merits of Free Trade, and that he had therefore no responsibility for an incendiary campaign. To that I reply '*proximus Ucaligon ardebat*,' which I may venture to construe: '*proximus*' in an adjacent constituency, '*Ucaligon*' the right hon. and learned gentlemen, '*ardebat*' was letting off Chinese crackers." (Loud laughter.)

His bolt passed next under the inadequate harness of Mr. Chiozza Money, who had displayed certain articles of food in his constituency in order to reinforce his diatribes against Protection.

"I must, however, in candour admit that the question of cheap food was brought forward in many constituencies with great persistency and ingenuity. The hon. member for North Paddington, with an infinitely just appreciation of his own controversial limitations, relied chiefly on an intermittent exhibition of horse sausages as a witty, graceful and truthful sally at the expense of the great German Nation."

The Opposition were now cheering every sentence. Great gusts of laughter passed over the House; the speaker remained completely immobile. The tall bent figure stood there looking down upon the House; only the lips moved, and from them in a passionless, slightly monotonous drawl came forth this astonishing flood of invective. Snowden, freed from the anxiety of his own debut, watched the scene entranced. Next day he wrote:

"It was a piece of comedy more admirably acted than can be seen on the stage for many long moons. The speaker was absolutely impassive and immobile. The roars of laughter, which nearly every sentence called forth, brought not the faintest ripple of a smile into the look of supreme contempt which covered the speaker's face. The Tories were sent into ecstasies of hilarious joy. The members of the Front Bench, Balfour, Chamberlain and Wyndham, lost all the restraint of dignity, and gave themselves up to convulsions of enjoyment."

He set them subtle traps, and covered them cleverly with brushwood, and the Liberal elephants blundered into them one by one:

"I do not suppose that now the fight is over, now that the strategy has been so brilliantly successful—away from the licence of the platform where their statements can be met and dealt with—hon. gentlemen will deny that the immediate effect of a two-shilling duty on corn will be an illimitable development of colonial acreage suitable for the growth of wheat. (Cries of 'Oh, oh' and loud derisive laughter). I am astonished to hear sounds of derisive dissent, for I rather thought that at the time that Lord Rosebery—from whom I am quoting with verbal precision—made that prediction to frighten the British farmer from tariff reform, hon. gentlemen were in the same tabernacle, or furrow, or whatever was the momentary rendezvous of the Liberal party.....I venture to ask

hon. gentlemen to tell us in the candour of victory, whether anyone really doubts that Canada would in a few years be able, under judicious stimulation, to supply the whole English consumption of wheat. (Cries of 'No, no!') Sir Wilfred Laurier says it can, and hon. gentlemen say it cannot. Perhaps the Under-Secretary for the Colonies, whom I am sorry not to see in his place, will put Sir Wilfred Laurier on the black list with Lord Milner, and refuse to protect him any longer. Does the House recollect La Fontaine's insect, the species is immaterial, which expired under the impression that it had afforded a life-long protection to the lion in whose carcase its life was spent?"

He demanded what explanation there was, apart from the need of fiscal change, which explained the growing poverty of the poor. There were cries of "The War!" but he retorted that the conditions were anterior to the War, and he added:

"While the only panacea which hon. gentlemen opposite can suggest is the employment of broken-down artisans in planting trees and constructing dams against the encroachment of the sea, the Unionist party need not be discouraged by their reverses at the polls. We will say of the goddess who presides over the polls, as Dryden said of fortune in general:

'I can enjoy her when she's kind,
But when she dances in the wind,
And shakes her wings and will not stay,
I puff the prostitute away!'"

Then his most skilfully baited trap was sprung. He continued:

"Was the verdict unqualified, having regard to the aggregate number of votes polled on behalf of Liberal members? The votes polled at the last election for Liberal, Labour and Nationalist candidates were three million, three hundred thousand, while those polled for tariff reform candidates and other gentlemen sitting around me

were two million, five hundred thousand. (Cries of 'No, not true.') I gather it is suggested that my figures are wrong. (Cries of 'Yes.') They probably are, I took them from the *Liberal Magazine*. (Laughter.) Probably the Minister of Education (Mr. Birrell) was responsible for them before he gave up the hecatomb¹ line of business, for the Christian toleration and charity department." (Loud laughter.)

Later he said, amid roars of laughter mingled with angry shouts:

"I have heard the majority on the other side of the House described as the pure fruit of the Cobdenite tree. I should rather say that they were begotten by Chinese slavery out of passive resistance, by a rogue sire out of a dam that roared."

"The Free Church Council," he added, "give thanks publicly that Providence inspired the electors with the desire and the discrimination to vote on the right side. Mr. Speaker, I do not, more than another man, mind being cheated at cards, but I find it a little nauseating, if my opponent then publicly ascribes his success to the partnership of the Most High!"

Then he came to the peroration; his voice gathered intensity and force, and his face became more animated:

"What the future of this Parliament holds in store for hon. gentlemen opposite, I do not know, but I hear that the Government propose to deny to the Colonial Conference of 1907 free discussion of the subject which the House is now debating, so as to prevent the discussion of unpalatable truths. I know that I am the insignificant representative of an insignificant numerical minority in this House, but I venture to warn hon. gentlemen opposite that the people of this country will not readily forget or forgive a party, which in the hey-day of its triumph denies to the infant Parliament of the Empire one jot or tittle of that ancient liberty of speech which our predecessors in this House vindicated for themselves at the point of the sword."

¹ Mr. Birrell had during the war in 1902 used the phrase "hecatombs of slaughtered babes."

He sat down and the Opposition shouted itself hoarse, for out of that beggarly minority, crushed almost beyond the instinct of retaliation, there had emerged a man who dared to challenge the Liberals and make war on them with a laughter that glittered and out. A memorable scene followed. His own Front Bench turned round to congratulate him, and a crumpled note was passed down the benches from Mr. Tim Healy, the Nationalist member, and the finished master of Parliamentary shock tactics, saying:

"I am old, and you are young, but you have beaten me at my own game."

Mrs. Smith sitting, thrilled in the gallery, looked down upon a House humming over the *tour de force*. F. E. rushed up to speak to her, and to say good-bye, for he had an important case next day in Chester, and was leaving by the midnight train. Mr. Lloyd George, replying for the Government in his first speech from the Front Bench, said, "We have just listened to a very brilliant speech."

F. E. Smith saw his profound belief in his own powers triumphantly justified by trial. As Mr. Garvin wrote years later: "he spoke for an hour, and put the House in his pocket." When he sat down his Parliamentary reputation was made. There were not wanting critics who, while praising the speech, said that it had contributed no knowledge to the debate. This was true. There was no attempt to produce a serious debating argument against the motion. The speech consisted of a brilliant cluster of impertinences, about the manner in which the election was won, and the records of different Liberals in that election. But this was no unintentional oversight: it seemed to Smith that his party was absolutely in despair. It had suffered one of the greatest

disasters of its history at the polls, and the insolent Parliamentary manners of that swollen majority had had a cowering effect upon it. Conservatism needed a *pique de cœur*. Smith's speech was designed not only to rivet attention to himself, but also to stiffen his colleagues, and breathe life and passion into the attack on the Government. He thought it, therefore, no time for a scientific analysis of the fiscal question; that could come later—just as he thought it no time to ask for indulgence, but rather to speak with all the concentrated insolence of which he was capable, and risk the worst consequences.

He did not fully realize how great a sensation he had stirred until he stopped at Chester and bought all the papers. Every paper displayed captions such as: "New Tory Orator." The expression "rising hope of the Tory Party," was filched from Lord Randolph and bestowed upon him. The sensation was immense and there was hardly a dissentient voice. A few extracts will be sufficient to show how public opinion was stirred. Mr. G. D. Faber, later Lord Wittenham, wrote in *The Times* long after:

"... from those lips, for something like the three-quarters of an hour words came forth with unerring and remorseless certainty. There was no external sign of nervousness: at the end of ten minutes that voice and that personality held the House. There were no jeers from the other side of the House, but plenty of cheers from ours. Light badinage and cutting sarcasm came with equal dexterity in that even magnetic voice which never faltered nor failed. It was a long, sustained, *tour de force*, which captivated and held friend and foe alike. His logic was inexorable, his denunciations were wonderful, his satire played like forked-lightning. I had heard many maiden speeches, and I have heard many since, but this one stood and stands alone in my memory.

The young, new member who had been sitting beside me with his parliamentary fortunes to make, rose a new member with his parliamentary fortunes made. He had not to wait till next morning to wake and find himself famous. He became famous there and then."

Harold Gorst wrote:

"Seldom has such a scene been witnessed as took place when Mr. F. E. Smith addressed his maiden speech to the House of Commons. He was certainly not an undistinguished figure as he got up from his place just behind Mr. Balfour and caught the Speaker's eye. Tall, clean shaven, with black hair and magnetic eyes almost as dark in hue, with a trick of bending forward as if addressing an audience from a high platform, he impressed those who noticed him for the first time with the premonition that he possessed unusual intellectual gifts. When he began to speak the House was captivated by the richness of his voice, and when it found him reeling off witty and original epigrams with easy fluency and perfect self-possession at the expense of the Government, its delight knew no bounds. Mr. F. E. Smith kept it up for an hour, and all the time members, ministers and ex-ministers leaned back and abandoned themselves to laughter, indignation, and all the other emotions called forth by the speaker's wonderful command of his audience."

The *Outlook* spoke of "the most brilliant maiden speech made in the House of Commons in living memory," but several other papers described it as the greatest maiden speech of all time.

We can easily understand the exultance which filled him as the train rushed northward through the dark fields. His whole life had been a preparation for this moment of dizzy triumph. All the day-dreams, all the most potent ambitions that raced through his mind as he sat in his room at Wadham on long winter nights had spelled out empire in Parliament

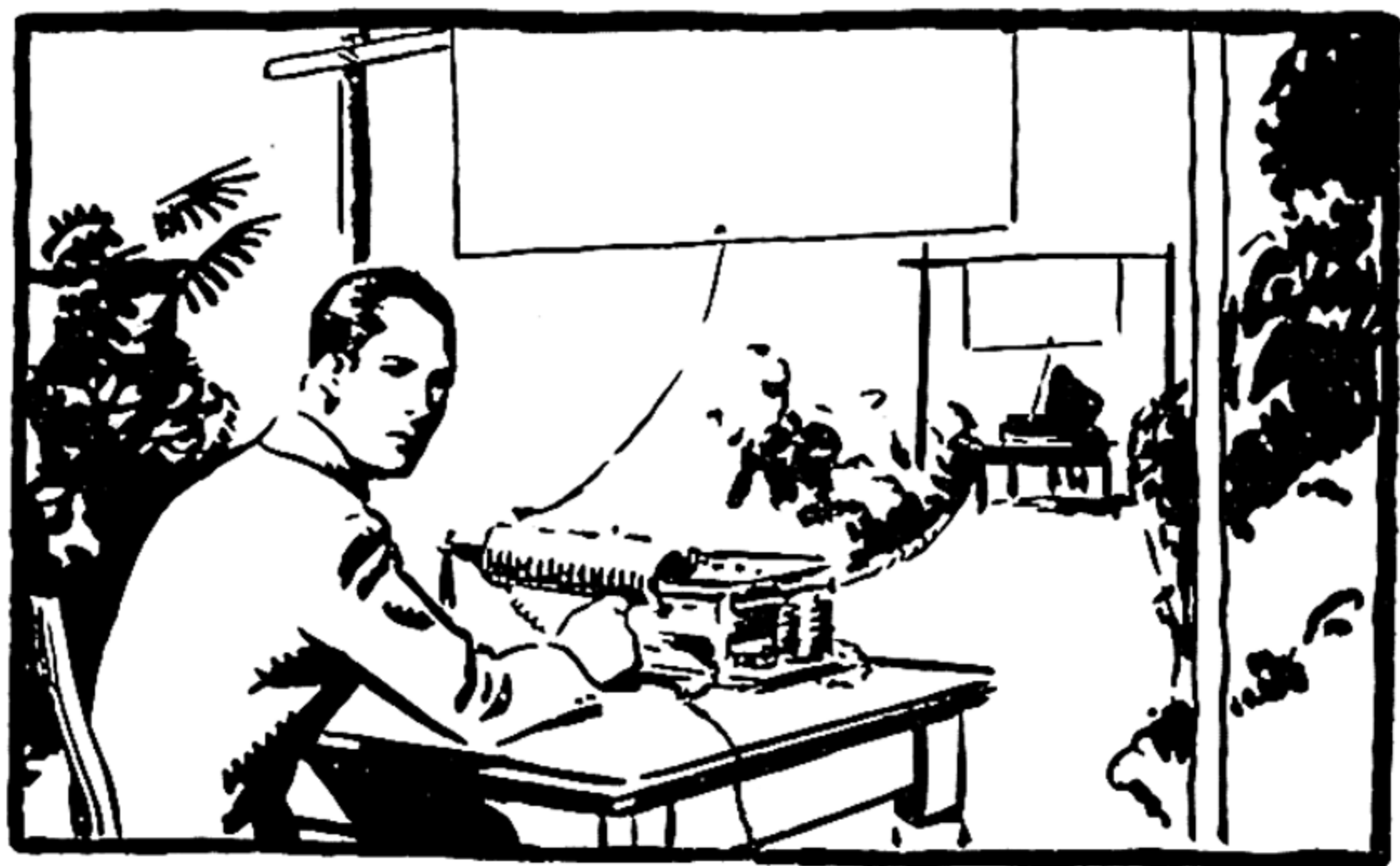
as their real, their cherished consummation. Then those disputatious evenings in which we have watched powerful but immature minds clashing in debate, taking each other's measure, inveighing without mercy, constructing the artillery of speech, leading on to the more measured and formal duels of the Union, all these were parts of the slow progress towards the same goal. His ambition had never faltered in the direction in which it beckoned him; even the barrister was blinded by the new glare which beat upon the politician.

LORD BIRKENHEAD, *Frederick Edwin, Earl of Birkenhead.*

GUGLIERMO MARCONI

➤ ONE night in the summer of 1894, as he lay sleepless in a bed in an Alpine hotel, the idea came to Guglielmo Marconi that electric signals could be sent through the air from one place to another. From that time, when he was twenty years old, until his death, he worked at that idea. Fantastic as his audacious theory seemed, he proved its truth. To his genius, his patient and determined research and investigation we owe wireless. Of him it may be said he opened the ears of the world to the world. He made the sea safer for the mariner, and the air for the airman; he banished loneliness from the lives of those who live in solitary places, and he brought solace to the blind.

The extract quoted from his biography recounts his first successful experiment, which, trifling though it may seem, proved his theories, and was the foundation on which his later work was to rest.



THE MARCHESE MARCONI RINGS A BELL

IN strange contrast to the events of his second visit, Marconi does not recall his first visit to England. He was about three years old and the family went to live at a large old-fashioned house on the outskirts of Bedford, known all over the world as the birthplace of John Bunyan. Colleorton Villa, Bedford, still stands, but how few people know that once its old-fashioned, oak-panelled passages re-echoed to the pattering footsteps and laughter of Marconi and his brother.

After about three years the Marconi family returned to Italy and went to live once more at the Villa Griffone which, with its surrounding land, was a more suitable home for growing boys than the Palazzo Marescalchi would have been.

It was at the Villa Griffone that Marconi's first education began; previously he had only received such lessons as his mother and nurse thought necessary to occupy his childish

mind and keep him out of mischief. A tutor was engaged, so that when the family moved to Florence or Leghorn for the winter his studies were not interrupted.

The winters are severe in Bologna, and the Signora Marconi's health was affected by the cold, which was the principal reason for this annual family migration.

It was while they were in Florence during a winter when Marconi was about fourteen, that Giuseppe Marconi decided that the time had arrived when his son should go to a college. As the result of this resolution he was sent to the Institute Cavallero in the Via delle Terme, and it is here that his interest was first turned to the study of chemistry and physics.

When the family took their next winter sojourn, it was in Leghorn; here Marconi appealed once more to the sympathies of his mother, and through her influence he was allowed to attend the Leghorn Technical Institute. His keenest interest was now centring on the exact science of physical chemistry. It no longer wandered, and with that painstaking passion for concentration, he was devoting his mind to the subject.

With his attendance at the technical school Marconi became so engrossed in his work that his mother became anxious about him and feared that he might injure his health. She consulted a doctor who wisely told her that more harm would be done by trying to get the boy away from his work. "With a boy like that," he said, "you should try encouragement."

Partly at his own request and partly upon the advice of friends the Signora Marconi took her son to Professor Rosa, who was a well-known lecturer at the University. He was

much interested in the young Marconi, and it was arranged at once that he should give him private lessons.

He was indeed getting to grips with his subject, and science was rapidly becoming the greatest and most absorbing interest in his life.

It must not be imagined, though, that Marconi was a prig, who studiously avoided all forms of amusement and recreation; this impression would be far from the truth. Without being unduly tiresome he had the usual boy's ability for getting into scrapes, but some of his earlier recreations show that he must always have been very level-headed. He was always extremely fond of the sea; at nine years old, he was able to sail a small boat, and with his brother he spent many happy hours in the bay off Leghorn.

As a young man of twenty, Marconi's aim was to acquire an ever-increasing knowledge of physics and chemistry. That in itself was an end. His father kept him provided with funds, though it must be admitted that the elder Marconi never parted with money for his son's experiments except under protest. A request for another 100 lire or so was not granted without a full explanation as to how it would be expended, and every inventor knows that it is extremely difficult to estimate the exact cost of perfecting an experiment in the initial stages. His mother looked after his physical needs; Marconi did not look beyond this in daily affairs. The whole of his mental and physical energy were directed unerringly towards one mark. Nothing could deflect him from that when he was twenty years old. Nothing has done ever since.

During the summer of 1894, he went with his brother and half-brother to the mountains of Biellese, and whilst in these

Italian Alps an idea came to him. From that moment in which he lay, half awake, half asleep, in a strange bed in that Alpine hotel—he was convinced that electric signals could be sent through the air from one place to another. He was, he says, finding sleep elusive and with the smell of the pine-trees in his nostrils and the creaking of timbers about the old inn, it seemed like that he would still be awake when the sun was up. From worrying about this minor detail, his mind turned to thoughts of Hertz and his experiments, and it was as he considered and contemplated upon what Hertz had achieved that a conviction came to him. He recalls that he had made a momentous decision before sleep finally claimed him. When he awoke in the morning, the thoughts of the night before had not vanished entirely as is so often the case in such circumstances. He thought again and felt more than ever convinced that wireless telegraphy was possible, not merely an inventor's dream. From that moment he set about making it a reality in this world, with a painstaking application to detail which was indeed worthy of his father Giuseppe.

Of this ambition, Marconi says, "The idea of transmitting messages through space by means of etheric waves came to me suddenly as a result of having read in an Italian electrical journal about the work and experiments of Hertz."

Marconi at that stage of his career, seldom missed reading any Italian publication which might be likely to tell him anything about his cherished ambitions. "It was a long and interesting article; Hertz had just died—actually in the preceding January. The idea obsessed me more and more, and in those mountains of Biellese I worked it

out in imagination. I did not attempt any experiments until we returned to the Villa Griffone in the autumn, but then two large rooms at the top of the house were set aside for me by my mother. And there I began experiments in earnest."

Marconi had the key of these rooms and even when he was working in them on his experiments he kept the doors locked. He rose early to get back to his work, and he worked late. His mother was concerned to see, night after night, a light burning at the top of the house, and she would often knock softly on the door before retiring to bed. A dishevelled, untidy young man would open the door for her and draw her inside, showing her his batteries, the home-made apparatus, the seemingly endless tangle of wire and coils.

"I think you should go to bed," his mother would say.

"I will when I'm tired," was his invariable answer.

▲ They usually spoke English together.

Signora Marconi was allowed inside the room, but no one else. Old Giuseppe was provoked to mild complaint when he learned that servants were only permitted inside the rooms on rare occasions, strictly supervised, in order to remove dust and dirt.

"What is there about these things he is making that calls for a state of siege?" the old man asked.

"Other people disturb his experiments," Marconi's mother explained. "It is not much to give him two attics for himself."

"He is never out of those rooms. Perhaps he has told you what his idea is; for my part, I must confess that he leaves me entirely in the dark."

And on that memorable occasion Signora Marconi sat herself on the arm of her husband's chair. "His idea," she said softly, "is that it is possible for signals, voices even, to be sent from place to place, through the air...."

The old man had wrinkled his brow incredulously at her and was on the point of expressing himself suitably on the subject of voices in the air, when he stopped himself abruptly. There was something in the Signora's eyes put there by faith in her son: the Signora was a lovely woman, and her eyes were by no means her worst feature. Marconi had his first, and for all time his most faithful, disciple in the Signora, his mother.

"Well, let him experiment," the old man allowed, gruffly. "Yet, it would be pleasant occasionally to see something of one's son."

Marconi has always been self-reliant and sparing of words. In those early days he told no one except his mother of his hopes. His was a sensitive nature, and he shrank from mockery or even lack of sympathy in others. At the time of his first experiments that incongruous streak of common sense told him that his idea, that aim which was such a reality to him, must indeed show fantastic in the eyes of others. He took pains to avoid bringing his ambition to the crude test of common criticism. He has been thought indifferent to the opinions of others. He has been written down as taciturn and unmindful of the niceties of intercourse. Marconi is, and has always been, essentially retiring by nature, and rather oversensitive to adverse criticism. He has confessed that his early attachment to fishing of any description had its origin in his wish to get away from others, and gain for himself the opportunity to think without feeling

either self-conscious or that he was being inconsiderate to others, who might wish to talk. This, perhaps, accounts for the fact that as a fisherman, Marconi has never been as successful as he would have wished. Though he admitted, "I have caught some good-sized fish in my time." In later years he indulged in this hobby on his visits to Ireland, where his efforts were not always ill-repaid.

In those two rooms at the top of the Villa Griffone Marconi made with his own hands most of the apparatus he used. The results of his untutored efforts was not neat, and this not because Marconi was not deft with his fingers, but because there were scarcely any of the devices he required manufactured; practically everything which he used had to be home-made or contrived. Much of the apparatus he used then makes him smile now. This mattered little, however, for his purpose was fixed and his purpose keen. In many of his early experiments Marconi was complimented by his friends and assistants on his capability of making instruments and devices which fulfilled their purpose from the most primitive beginnings. Probably this was due to his vivid imagination which always enabled him to foresee just how a certain thing would turn out in the end. All during his career this ability has served him to very good purpose. Time did not exist in his schedules. The experiment went through: and if he did nothing of a constructive nature to allay the fear that existed in the minds of the maids at the Villa Griffone that sudden death lurked in the strange pots which housed his batteries at least he saw to it that if his experiments went wrong—which they almost invariably did—his was the hand responsible for the failure.

For detecting the waves radiated from his transmitting oscillator, Hertz had used a metal hoop which had a small gap at one side. When this hoop was brought within the influence of an electrical disturbance set up by his oscillator, minute sparks crossed the gap.

Hertz contended that this gave proof that electric waves when radiated into space could be detected by means of a metal hoop. This theory was the basis of Marconi's experiment—and the intricate structure of his high ambition.

"It seemed to me at this time," Marconi says, "that if this radiation could be increased, developed and controlled, it would most certainly be possible to signal across space, for very considerable distances. My chief trouble was that the idea was so elementary, so simple in logic, that it seemed difficult to me to believe no one else had thought of putting it into practice. Surely, I argued, there must be much more mature scientists than myself, who had followed the same line of thought and arrived at an almost similar conclusion. From the first my idea was so real to me that I did not realize that to others the entire theory must appear quite fantastic. A problem is always simple—when solved. To radiate was not easy, and there were a thousand and one things to make the pioneer's path difficult. From the beginning I aimed at interfering with the radiation from the oscillator, breaking the emission up into short and long periods, so that the semblance of a 'dot' and dash could be transmitted. It was in December, 1895, that I first succeeded with my radiation problems. The winter was severe, but my mother decided that she would stay with me at the Villa Griffone, so that she could be near me at my work; she was deeply interested in all the work I did and

every step of progress, which I made, however small and apparently unimportant it might be."

It was indeed a proof of the depth of the Signora's interest that, despite her delicate health, she prevailed upon the family to change from their usual winter habit—and remain at the Villa. She always kept an eye on the light that burned at the top of the house half the night, and mounted the stairs from time to time to knock on the locked door. Occasionally a maid would accompany her bringing a tray of food to the young man, who sometimes forgot that meal-times existed. For all this she was in her own heart well rewarded.

The Signora, one December night, had retired to bed, leaving the Villa in quiet and darkness, except for the light in the attics. Gugliemo had promised, when she knocked on his door, that he would not be long that night before he, too, was in bed. She had been asleep for some hours when a hand, shaking her shoulder, woke her. By her bed she saw Gugliemo, with a candle in his hand. That firm mouth of his was firmer, and the wavy brown hair that dragged over his solemn forehead was in more than customary disorder.

"Come, mother," he urged, "let me show you."

With the Signora there was no need for explanations. She knew. Clothing herself in a dressing-gown she slipped her arm through that of her son, and together they climbed the stairs.

"You're cold, boy," she said.

"I have finished now, mother, for to-night," Marconi told her absently. "I want you to see."

The long attic rooms were lit by lamps, and in the yellow half-light Signora Marconi saw at one end a mass of

apparatus that even her sympathy could not make her begin to comprehend. A tangle of wiring loomed above this apparatus. Through the archway, in the attic beyond was a compact group of batteries, zinc rods, and coils. At their side, as they stood, was a small table on which was a key.

"Listen, mother," said the boy. He pressed the key.

From the far end of the attics came a buzzing. The Signora, shivering in her peignoir, waited for more. But that, it seemed, was all. "It's wonderful!" she said.

With an arm round her shoulders Marconi took her back to bed. And wonderful it was. He had succeeded in making an electric bell ring. This had been done by means of a radiation at a distance of some 30 ft. across space.

Later this young man was destined to bridge the English Channel with messages carried in a manner unknown to the world on that cold December night, when he burned his light late into the night in order to turn his dreams into undisputable facts. Later still the vast Atlantic Ocean was to be bridged, but it would be scarcely true to say that even these two great epoch-making events gave him a greater thrill than when the electric bell connected with his experimental set tinkled out its shrill note.

Giuseppe Marconi was not as enthusiastic as he might have been over such an event; a bell could be made to ring by more than one means, he thought—but the bell made history.

D. M. B. COLLIER and B. L. JACOT, *Marconi, Master of Space.*

THE WRIGHT BROTHERS

THE following extract contains an account of the lives of Wilbur and Orville Wright, and therefore it is not necessary to preface it with biographical details of them. Some information, however, of the men who had an influence on their work will be of help to the reader.

What assistance the Wright brothers obtained from earlier aeronautical pioneers came from two men. Otto Lilienthal was born in Pomerania in 1848. Like all great students of flight Lilienthal went to the birds, the true masters of the air, to learn his lessons. With infinite patience he collected information. He made as detailed a study as he could of the nature of air resistance. He experimented with various kinds of wing surfaces, and proved the superiority of the curved or cambered wing. His instinct, however, told him that the real work must be done in the air itself, and he therefore determined to make a machine in which he could fly. From 1891 to 1896 he experimented with gliders and made flights of over 100 yards. It was in making the last of these that his machine crashed from a height of fifty feet and he was killed.

The other man to whom the Wrights were indebted was Professor Langley of Washington. Langley was an elderly man before he turned his attention to aeronautics—he had no intention of becoming a flying man. He did however investigate the science of aero-dynamics much more thoroughly and successfully than it had been done before, and he was able to express his results in definite mathematical terms. He demonstrated his conclusions by model aeroplanes which were fitted with light steam engines, one of which flew for over three-quarters of a mile. Langley also realized that the steam engine, from its weight, was unlikely to be a suitable power for an aeroplane, and he worked also on constructing an internal combustion engine. In this part of his work, however, he was not successful, although the aeroplane to which it was fitted was later reconstructed and flown successfully in 1914.



THE WRIGHT BROTHERS BUILD AND FLY THE FIRST AEROPLANE

§ 1

THE story of Wilbur and Orville Wright's determined struggle to solve the problems of heavier-than-air flight is a story of splendid endeavour rewarded by splendid success. Theirs was certainly one of the greatest attainments of this or any preceding age; a triumph that was gained by the exercise of those qualities of brain and heart that in the material sphere have raised mankind to the predominating position it occupies on this planet. Properly understood and appreciated, it is a story that should kindle the imagination to as fine an elation as any tale of heroic exploits of remoter days. The fullness of the triumph does not belong to the Wrights alone; it is shared by all those adventurers who through hundreds of years had sought to bring the regions

of the air within the ambit of man's activity, and may be shared by any who have the ambition to enlarge the fields of this conquest. But the long romance of endeavour culminated in the work of the Wrights, and theirs was the decisive victory. Moreover, the combination of qualities which the brothers brought to bear upon their task included all those that throughout had made progress possible and were essential for ultimate success.

The era in which we live is characterized by its great scientific inventions, whereby man has so vastly increased his control over his surroundings and has been enabled to divert the hidden forces of nature to his own peculiar purposes. The harnessing of steam and electric power, and the liberation of the enormous energy dormant in oil are the chief, though not the only examples of this activity and form the basic resources on which most of the mechanical devices of modern civilization depend. One invention made possible another, and with growing momentum the development of machinery continued and still continues apace.

The aeroplane, though it was essentially part of the same process, differs in one striking respect from the other inventions of this period, such as the steam-engine, the telephone, or the internal combustion engine, and that is in the much wider demands it made upon the inventor. These no less wonderful devices were mainly the creation of man's intelligence and ingenuity; they proceeded from the brain. It required a clever and painstaking genius to invent the electric telegraph and the gramophone, but it scarcely demanded physical courage, though in the latter instance a certain dour fortitude may have been called for during the experimental stages. High mental qualities were needed,

but, generally speaking, only mental qualities. With the aeroplane this was not the case. The aeronautical scientist might explore and expound the theory of heavier-than-air flight, and might construct a machine in every way adequate and efficient. This was not enough. Man had still to dare the actual experience of flight, and this required not only stark courage, but also skill, presence of mind, and a high degree of physical alertness. The man who spoke into the first telephone ran no risk; the men who flew the first aeroplanes took their lives in their hands. The slightest error of judgment, a single false movement, might prove and unhappily all too often did prove fatal. The aeroplane in its evolution made heavy demands upon the resources not only of the mind but of the body also.

Without prejudice to Lilienthal's scientific work it may be said that he and Langley stand as representatives of the two distinct qualities required by the aeronautical pioneer. Langley was the scientist, the student of flight; Lilienthal was the man prepared to venture into the air itself. In the Wright brothers these two qualities were most happily blended and operated together in complete accord. They left nothing to chance; they were willing to dare anything. Moreover they were fired with a burning enthusiasm for the cause of flight, and at the same time were capable of taking infinite and unflagging pains over the smallest and most irksome practical detail. At one and the same time they were cautious plodding workers, romantic visionaries, and cool headed courageous adventurers. No one could have been better equipped by nature for the task which they so determinedly set themselves to accomplish.

Wilbur and Orville Wright worked together in all their

researches and experiments. Mr. Griffin Brewer, who knew them well and was closely acquainted with their methods, declared that it was impossible to say where the work of one brother ended and that of the other began. Neither deserved greater credit than the other; the merit of their success belonged equally to both, or, more truly perhaps, to the singularly effective collaboration between them. Their efforts should be considered as the outcome of one common determination.

§ 2

Wilbur Wright, the third son of Milton Wright, was born near Newcastle, Indiana, U. S. A., in 1867, and Orville was born in 1871 at Dayton, Ohio, where the Wrights were then living. They were of New England stock, one of their ancestors having emigrated from England as early as 1637. While still a boy Orville possessed himself of a primitive printing outfit and began to publish a boys' paper. Later, with an improved press he produced a weekly newspaper, *The West Side News*. Wilbur then joined him in the capacity of editor, and soon they were publishing a weekly magazine in addition, which they called *Snap Shots*. Wilbur, who had a crisp and telling literary style, contributed numerous articles on local affairs. These were the great days of the "safety bicycle," and the brothers, apt and business-like as they always were, started the Wright Cycle Company, manufacturing a machine known as the "Van Cleve," which won a local reputation for soundness and good workmanship. They were thus engaged when their attention was first directed to aeronautics.

It was in 1896 that a newspaper paragraph recording the death of Otto Lilienthal in Germany, and giving a brief account of his exploits, roused their interest in flying. It is a pleasant thought that Lilienthal, who in his life had done so much for the cause of flight, should by his death have inspired with something of his own ardour the two young men who were destined to take up the work to which his life had been devoted and bring it to fulfilment. The incident of Lilienthal's death seems to have made a deep impression upon Wilbur, and he was moved to re-read one of his favourite books, Marey's *Animal Mechanism*. "From this I was led," he later declared in a lecture, "to read more modern works, and as my brother soon became equally interested with myself, we soon passed from the reading to the thinking, and finally to the working stage."

They read all the existing aeronautical literature that they could lay hold upon; the writings that most encouraged them were those of Lilienthal and Langley, and from them they were soon able to estimate the stage of progress that aeronautical science and practice had actually reached. They were also influenced by the work of Stringfellow, whose designs they regarded as valuable contributions to the development of the aeroplane.

From the writings and lectures of Wilbur Wright it is possible to follow the progress of their work without difficulty. One cannot do better than quote Wilbur's own account whenever their actual activities need to be recorded, and the matter is pertinent to the subject of this chapter. From the very outset the brothers realized that all the pioneers had been handicapped, in varying degrees, by one thing, namely,

lack of experience in handling a machine in the air. Lilienthal's death had been due to this very cause.

"It seemed to us," Wilbur stated in the lecture already mentioned, "that the main reason why the problem had remained so long unsolved was that no one had been able to obtain any adequate practice. We figured that Lilienthal in about five years of time had spent about five hours of actual gliding through the air. The wonder was not that he had accomplished so little, but that he had accomplished so much. It would not be considered at all safe for a bicycle rider to attempt to ride through a crowded city street after only five hours' practice, spread out in bits of ten seconds each over a period of five years; yet Lilienthal with this brief practice was remarkably successful in meeting the fluctuations and eddies of wind gusts. We thought that if some method could be found by which it would be possible to practise by the hour instead of by the second there would be the hope of advancing the solution of a very difficult problem. It seemed feasible to do this by building a machine which would be sustained at a speed of eighteen miles per hour, and then finding a locality where winds of this kind were common."

The Wrights, therefore, after their preliminary study of aeronautical literature, during which time they were, so to say, surveying the problem from a distance and meditating how best to approach it, decided that the first thing to do was to build a glider. They condemned as "wasteful and extravagant" any method which included the construction of a machine before one knew how to fly it, "mounting delicate and costly machinery on wings which no one knew how to manage." Their decision could not have been such a simple one as it now appears. In 1896 Lilienthal had been killed, and Chanute, after limited successes, had abandoned his experiments: in the following year Percy Pilcher met his death in England. Gliding, in the face of such events, was

not the kind of hobby to which one would lightly turn: how much more reasonable, if one must dabble in aeronautical research, to continue one's activities to the experimental shop and the construction of model machines. Such considerations did not appeal to the Wrights. For some little time they studied the flight of birds, hoping to gather some suggestion of the means by which they secured their balance. They came to the conclusion that this was done instinctively; the result of inherited aptitude and constant practice. So too it must be, in part, if men were to fly, they concluded.

"Now, there are only two ways of learning to ride a fractious horse," wrote Wilbur Wright with caustic humour, "one is to get on him and learn by actual practice how each motion and trick may best be met; the other is to sit on a fence and watch the beast awhile and then retire to the house and at leisure figure out the best way of overcoming his jumps and kicks. The latter system is the safer, but the former, on the whole, turns out the larger proportion of good riders. It is very much the same in learning to ride a flying-machine; if you are looking for perfect safety you will do well to sit on a fence and watch the birds, but if you really wish to learn you must mount a machine and become acquainted with its tricks by actual trial. The balancing of a gliding or flying-machine is very simple in theory. It merely consists in causing the centre of pressure to coincide with the centre of gravity."

With the admirable clarity of mind that characterized them the Wrights summed up the situation as it was when they began their experiments.

"The difficulties," wrote Wilbur, "which obstruct the pathway to success in flying-machine construction are of three general classes: (1) Those which relate to the construction of the sustaining wings; (2) those which relate to the generation and application of the power required to drive the machine through the air; (3) those relating to the balancing and steering of the machine after it is actually in

flight. Of these difficulties two are already to a certain extent solved. Men already know how to construct wings, or aeroplanes, which when driven through the air at sufficient speed, will not only sustain the weight of the wings themselves, but also that of the engine and the engineer as well. Men also know how to build engines and screws of sufficient lightness and power to drive the planes at sustaining speed. Inability to balance and steer still confronts students of the flying problem. . . . When this one feature has been worked out, the age of flying-machine will have arrived, for all other difficulties are of minor importance."

The work of the brothers falls fairly distinctly into two periods. To 1901 their primary object was to obtain experience in the air by means of gliding flights: in the construction of these first gliding machines they relied for the most part upon such aerodynamic "data" as already existed, modifying their machines only in detail when the results of their practical experiments suggested it. After 1901, convinced that far more accurate information was needed, they carried out detailed researches for themselves, constructed gliders of more original design, turned their attention to the production of a suitable engine, and were definitely aiming at free power-driven flight. The record of their work during this latter period becomes more scanty. Doubtless they were too busy to write or talk much, and though they made no attempt at secrecy, their work was now become far more individual in character, and presumably they shrank from anything in the nature of self-advertisement until their hopes were definitely realized and they could show results which admitted of no doubts or arguments. Like Langley, they knew that the only way in which flight could be proved possible was by making a machine that not only could but actually did fly.

Their first glider was modelled upon Chanute's later biplane type, with a few minor alterations suggested by their own studies. They had come to the conclusion that Lilienthal's method of obtaining balance by shifting the position of the pilot's body when required was unsatisfactory and dangerous. Chanute's plan of securing the greatest possible degree of inherent stability reinforced by adjustable parts, which could be controlled by the operator in flight, appeared to promise better results. They had originally planned to provide the gliders with a supporting surface of 200 sq. ft., but the inability to obtain enough suitable material finally compelled them to reduce it to 165 sq. ft., which according to Lilienthal's calculations would be sufficient to support the machine in a wind of about twenty-one miles per hour at an angle of three degrees.

As the result of information provided by the Weather Bureau at Washington they decided to carry out their first experiments at Kitty Hawk, near the Atlantic coast of North Carolina, where steady winds favourable to gliding might be expected. They pitched their camp in the summer of 1900. The death of Pilcher, following that of Lilienthal, led them to think that the dangers of gliding made it an unreliable method of experiment, and they attempted at first to attach a line to their machine and fly it as a kite. The results showed them that some of their expectations, based on Lilienthal's figures, could not be realized, but in the main this system proved inadequate, and they decided that actual gliding flights must be undertaken if real progress was to be made. They moved a distance of four miles to the Kill Devil Sand hills and there began to practise short gliding flights without mishap.

They proceeded at first with extreme caution, making their glides as near the ground as possible, and doing everything to eliminate unnecessary risk. They knew that they must learn to walk before they could run; and they knew, moreover, quite apart from the natural instinct of self-preservation, that the security of their lives was the prime essential to the success of their project. The unavoidable risks of their enterprise were sufficiently grave; to have neglected any precaution, whether out of carelessness or foolish bravado, would have seemed to them the essence of inefficient workmanship. The foremost necessity was that they should retain their lives for the continuance of the task.

Wilbur Wright has given an account of this first year's practical work.

"The slope of the hills was 9.5 degrees, or a drop of one foot in six. We found that after attaining a speed of about twenty-five or thirty miles with reference to the wind, or ten to fifteen miles over the ground, the machine not only glided parallel to the slope of the hill, but greatly increased its speed, thus indicating its ability to glide on a somewhat less angle than 9.5 degrees, when we should feel it safe to rise higher from the surface. The control of the machine proved even better than we had dared to expect, responding quickly to the slightest motion of the rudder. With these gliders our experiments for the year 1900 closed. Although the hours of practice we had hoped to obtain finally dwindled down to about two minutes, we were very much pleased with the general results of the trip, for, setting out as we did with almost revolutionary theories on many points and an entirely untried form of machine, we considered it quite a point to be able to return without having our pet theories completely knocked on the head by the hard logic of experience, and our own brains dashed out into the bargain. Everything seemed to us to confirm the correctness of our original opinion: (1) That practice is the key to flying; (2) that it

is practicable to assume the horizontal position—in their gliding flights the Wrights lay in a position horizontal to the ground, in order to lessen the direct wind resistance; (3) that a smaller surface set at a negative angle in front of the main bearing surfaces, or wings, will largely counteract the effect of the fore and aft travel of the centre of pressure; (4) that steering up and down can be attained with a rudder without moving the position of the operator's body; (5) that twisting the wings so as to present their ends to the wind at different angles is a more prompt and efficient way of maintaining lateral equilibrium than shifting the body of the operator."

The chief points in which this 1900 glider had differed from Chanute's biplane were in the absence of a vertical rudder in the rear and the employment of a "horizontal rudder" in front of the machine. This innovation was to prove very useful in securing fore and aft balance, lack of which, in certain circumstances, had been a weakness in Lilienthal's gliders. The brothers spent the following winter considering the results of the first year's experiments and making plans for the summer of 1901. They decided to construct a new glider on the same lines as their first, but having a wing surface of 308 sq. ft. Returning to Kitty Hawk in July they proceeded to test the new machine.

The first results were unsatisfactory, but by altering the position of the pilot's seat, or perch, they were enabled to make a glide of about 300 ft. Longitudinal balance, however, was maintained only with difficulty by making great play with the front rudder or elevator. Finally considerable alterations had to be made in order to reduce the depth of "curvature" originally allowed; after this they made numerous successful glides, the machine being easy to control even in comparatively strong winds.

During this period the Wrights had the assistance and advice of Chanute, who visited their camp and watched their experiments, giving them every encouragement when he discovered that they were interested in flying as a sport and not with expectation of making money out of it. It was in the September of 1901 that Wilbur Wright gave his lecture before the Western Society of Engineers, from which extracts have been given. His general impression at this time seems to have been that, while they had achieved considerable practical success, the calculations of previous experiments, on which they had so far been content in the main to rely, were often inaccurate and could not in practice be depended upon to give the desired results. As Wilbur later said:

"Having set out with absolute faith in the existing scientific data, we were driven to doubt one thing after another, till finally, after two years of experiments we cast it all aside and decided to rely entirely on our own investigations. Truth and error were everywhere so intimately mixed as to be indistinguishable. . . . We had taken up aeronautics as a sport. We reluctantly entered upon the scientific side of it."

At that time they ventured the opinion that man would ultimately learn to fly, but that it would not be in their generation.

While they may not have felt justified in making a more optimistic prediction, there can be little doubt that the Wrights secretly entertained higher hopes. From this time they directed all their energies to the problem which before they had treated as an exciting hobby. During the winter they carried out exhaustive researches with the purpose of building up a structure of aerodynamic "data" on which

they could absolutely rely. They made a wind tunnel and tested hundreds of forms of wing surface, carefully and methodically recording every result. The statistical tables thus prepared were both more varied and more accurate than those previously made by Lilienthal and Langley, and they used them in all their future constructional work. These researches lasted nearly a year, at the end of which time they had built a third glider, destined to be the parent of the first successful power-driven aeroplane.

The use of an horizontal elevator in the front of the machine had already done much to solve the problem of fore and aft balance. The difficulty of securing lateral stability was still to be overcome. Their new glider, designed in accordance with the knowledge gained from their recent experiments, was altogether a far more efficient machine than those of the years 1900 and 1901. In an attempt to obtain lateral balance they fitted a fixed vertical tail. With this glider they returned once more to Kitty Hawk in the autumn of 1902. The early trials were disappointing. The attempt to control the balance of the machine by means of adjustable wing edges had already provided inadequate. The fixed vertical rudder, or tail, which they had hoped would remedy the defects, served only to aggravate them by making it next to impossible to counteract any sideways tilt which might develop in the course of a flight. At length they conceived the plan of making the rear vertical rudder adjustable instead of fixed. This proved to be the long-sought solution to the problem. Adequate lateral balance was obtained, but the demands made upon the pilot during flight were increased, for he had three sets of controls to manage—those working the front horizontal elevator, those

maintaining the adjustments of the wing edges, and the new arrangement for adjusting the vertical rudder. Eventually they "decided to attach the wires controlling the vertical tail to the wires warping the wings, so that the operator, instead of having to control three things at once, would have to attend only to the forward horizontal rudder and the wing warping mechanism; and only the latter would be needed for controlling lateral balance."

The glider, thus improved, was found to be remarkably amenable to management.

"With this apparatus," said Wilbur Wright, "we made nearly 700 glides in the two or three weeks following. We flew it in calms and we flew it in winds as high as 35 miles an hour. We steered it to right and left, and performed all the evolutions necessary for flight. This was the first time in the history of the world that a movable vertical tail had been used in controlling the direction or the balance of a flying-machine. It was also the first time that a movable vertical tail had been used in combination with wings adjustable to different angles of incidence, in controlling the balance and direction of an aeroplane. We were the first to functionally employ a movable vertical tail in a flying-aeroplane. We were the first to employ wings adjustable to respectively different angles of incidence in a flying-aeroplane. We were the first to use the two in combination." At a much later period the Wrights, in order to protect their patent rights, were compelled to prove these claims, and they were in substance upheld in the law courts of America, England, and many continental countries.

The Wrights had now devised a flying-machine which was capable of flight and amenable to control. All that remained was to supply it with an adequate motive power. In comparison with what they had already done, this was a simple task. They turned to it, nevertheless, with the same zest and thoroughness that had characterized their previous

work. Before describing the final stage of their efforts, however, it may be well to give a brief description of the 1902 glider to which they were prepared to pin their faith in the attempt to attain sustained power-driven flight.

It was a biplane, the two main wings being 32 ft. in frontal width (span) and 5 ft. in depth (chord), giving a total supporting surface of about 305 sq. ft. The pilot lay horizontally across the middle of the lower plane. The so-called "horizontal rudder" in front had a sustaining area of 15 sq. ft. and the rear vertical rudder had an area of 6 sq. ft. Skids were used as an undercarriage to support the weight of the machine on the ground. The weight of the machine itself, without the pilot, was $116\frac{1}{2}$ lb. The manner in which the machine was controlled by adjustable parts has already been described.

It took the brothers rather more than twelve months to build a suitable engine and devise an efficient screw propeller by means of which its power could be made to react on the air. As Langley had discovered, no suitable engine was yet in existence. The efficiency of the internal combustion engine had been steadily growing during the latter half of the nineteenth century, and during its last decade, chiefly as the result of the work of Daimler, who since 1882 had been perfecting a light petrol engine for use in the motor-car, was beginning to assume something like its present form. It was still far too heavy, however, to be applied to aircraft. The Wrights realized that the weight per horse-power developed must be drastically reduced, whilst the strength and reliability must be retained. At the present day it is not utterly impossible to find large engineering firms with a big capital, stimulated by trade

competition, who may be willing to experiment with strange and unfamiliar designs. In 1902 this was quite impossible. There were no wealthy firms engaged in producing internal combustion engines by the thousand, to whom experiment was part of the day's work. Moreover, it was an article of the engineer's faith that weight and reliability could not be divorced, and engineers do not readily abandon their cherished beliefs. Another difficulty lay in the fact that existing factory plant was far more limited and unadaptable than it is to-day. Like Langley and earlier pioneers, the Wrights were compelled to design and construct their own engine.

The fact that in a year they succeeded in designing and constructing an engine giving thirty horse-power and weighing only 7 lb. per horse-power was in itself an accomplishment that might secure them a degree of fame. Indeed, their work in this connexion—like the equally meritorious achievement of Langley's assistant, Charles Manly—constitutes an engineering feat that only the more momentous success it made possible could have dwarfed to comparative insignificance. The difficulties involved in designing a suitable screw propeller might have confounded less resourceful and determined men.

At last, towards the end of 1903, all was ready. A new machine had been built similar to the successful one of the previous year. As they found that their engine developed more power than they had anticipated, they utilized the extra weight allowed them in strengthening the general structure. Once more they visited Kitty Hawk and fitted the engine to the new machine. After a few practice flights on the old glider they prepared for the great test. A general

invitation to be present at the trial was extended to the inhabitants of the district, but few responded. "Not many were willing to face the rigours of a cold December wind in order to see, as they no doubt thought, another flying-machine *not* fly." Five gentlemen turned up to witness the conquest of the air. They were Mr. A. D. Etheridge, Mr. W. S. Dough, Mr. W. C. Brinkley, Mr. John Ward, and Mr. John T. Daniels. Little would they think, as they came to the level ground north of the Kill Devil Hill, impelled probably more by casual curiosity of friendliness towards the young inventors than by any real interest in aeronautics, what an epoch-making event they were to see. For a truly epoch-making event was about to take place. Sir Walter Raleigh, in the first volume of *The War in the Air*, quotes the description of this famous morning written by Orville Wright for the Aeronautical Society of Great Britain. It is a concise and unadorned narrative.

"On the morning of 17th December, between the hours of 10.30 o'clock and noon, four flights were made, two by Mr. Orville Wright, and two by Mr. Wilbur Wright. The starts were all made from a point on the levels, and about 200 ft. west of our camp, which is located about a quarter of a mile north of the Kill Devil Sand Hill, in Dare County, North Carolina. The wind at the time of the flights had a velocity of twenty-seven miles an hour at 10 o'clock and twenty-four miles an hour at noon, as recorded by the anemometer at the Kitty Hawk weather bureau station. This anemometer is 30 ft. from the ground. Our own measurements, made with a hand-anemometer at a height of 4 ft. from the ground, showed a velocity of about 22 miles when the first flight was made and $20\frac{1}{2}$ miles at the time of the last one. The flights were directly against the wind. Each time the machine started from the level ground by its own power alone, with no assistance from gravity or any other sources whatever. After a run of about 40 ft.

along a mono-rail track, which held the machine 8 inches from the ground, it rose from the track and under the direction of the operator, climbed upward on an inclined course till a height of 8 or 10 ft. from the ground was reached, after which the course was kept as near horizontal as the wind gusts and the limited skill of the operator would permit. Into the teeth of a December gale the *Flier* made its way forward with a speed of 10 miles an hour over the ground, and 30 to 35 miles an hour through the air. It had previously been decided that, for reasons of personal safety, these first trials should be made as close to the ground as possible. The height chosen was scarcely sufficient for manœuvring in so gusty a wind and with no previous acquaintance with the conduct of the machine and its controlling mechanisms. Consequently the first flight was short. The succeeding flights rapidly increased in length, and at the fourth trial a flight of 59 seconds was made, in which time the machine flew a little more than half-a-mile through the air and a distance of 852 ft. over the ground. The landing was due to a slight error of judgment on the part of the operator. After passing over a little hummock of sand, in attempting to bring the machine down to the desired height the operator turned the rudder too far, and the machine turned downwards more quickly than had been expected. The reverse movement of the rudder was a fraction of a second too late to prevent the machine from touching the ground and thus ending the flight. The whole occurrence occupied little, if any, more than one second of time.

"Only those who are acquainted with practical aeronautics can appreciate the difficulties of attempting the first trials of a flying-machine in a 25 mile gale. As winter was already well set in we should have postponed our trial to a more favourable season, but for the fact that we were determined, before returning home, to know whether the machine possessed sufficient power to fly, sufficient strength to withstand the shocks of landings, and sufficient capacity of control to make flight safe in boisterous winds, as well as in calm air. When these points had been definitely

established we at once packed our goods and returned home, knowing, that the age of the flying-machine had come at last."

Wilbur Wright, writing in the *Century Magazine* in 1908, accurately describes the first of the four flights, that lasted twelve seconds, as "the first in the history of the world in which a machine carrying a man had raised itself into the air by its own power in free flight, had sailed forward on a level course without reduction of speed, and had finally landed without being wrecked."

Thus at last man had learned to fly. The hopes of many faithful workers were rewarded, not as it had so often seemed, with failure, but with success. The beginnings, it is true, were modest and not very spectacular, like the first uncertain flight of a nestling, but they were the certain beginnings of a mighty conquest, the full meaning and extent of which one can even now only dimly imagine. Man had added one more to the long tale of his triumphs over his natural surroundings.

C. L. M. BROWN, *The Conquest of the Air.*

T. E. LAWRENCE

IN the early days of the Great War, the British Government sent to Egypt a number of men who had special knowledge of the Near East. Among these was T. E. Lawrence, who as an archæologist had spent some years among the Syrians and Arabs. The British were giving some small help to the Sheriff of Mecca, who had revolted against the Turks. Lawrence, however, knew that little would come of the movement unless the Arab tribes would unite, and that because of blood feuds and jealousies this was most unlikely. But he saw also that if a leader could be found among the Arabs, wise enough and great enough to command the loyalty of the tribes, he might sweep the Turks out of Arabia, back past the gates of Damascus.

Our extract recounts his search for this leader, and his finding him in the Emir Feisal.

Lawrence believed and persuaded the Arabs that their success would mean the establishment of the independent state for which they had so long hoped and plotted. It would, in addition, be of the greatest assistance to the British in their campaign in Palestine.

This strange partnership of Arab prince and English archæologist accomplished what seemed the impossible. The tribes were united, the difficulties of money and supplies overcome, the Turks beaten, and Lawrence entered Damascus with the victorious Arabs.

But he felt himself dishonoured at the Allies' treatment of the Arabs at the Peace Conference, and disappeared from public notice. He was discovered under the name of Shaw as a private in the Tank Corps, and later as an aircraftsman in the Royal Air Force. He had left this service but a short time when he was killed in a motorcycle accident.

COLONEL LAWRENCE MEETS THE EMIR FEISAL

LAWRENCE and Storrs arrived at Jiddah in October 1916. The Sheriff's second son Abdulla came to meet them riding on a white mare, with a guard of richly armed slaves. He had just come home victorious from a battle at Taif, inland from Mecca, which he had won from the Turks in a sudden rush; he was in great good humour. Abdulla was reported to be the real leader of revolt, the brain behind Hussein, but Lawrence, summing him up, decided that he might be a good statesman and useful later to the Arabs if ever they succeeded in winning freedom (and his judgment of the present King of Transjordan was correct), but he did not seem somehow to be the prophet who was needed to make the revolt a success. He was too affable, too shrewd, too cheerful: prophets are men of a different stuff. Lawrence's chief object in coming to Jiddah was to find the real prophet, if there was one, whose enthusiasm would set the desert on fire; so he decided at once to look elsewhere.

Meanwhile Abdulla talked to Lawrence about the campaign, and gave him a report to be repeated to headquarters in Egypt. He said that the English were largely responsible for the Arab lack of success. They had neglected to cut the pilgrim's railway, and the Turks had therefore been able to collect transport and supplies to reinforce Medina. Feisal had been driven from Medina and the enemy there was now preparing a large force to advance on Rabegh, the Red Sea port. The Arabs with Feisal who were barring their road

through the hills were too weak in supplies and arms to hold out long. Lawrence replied that Hussein had asked the British not to cut the railway because he would soon need it for his victorious advance into Syria, and that the dynamite which had been sent to him had been returned as too dangerous to be used by Arabs. Moreover, Feisal had not asked for more supplies or arms since the time when Egyptian gunners had been sent.

Abdulla answered that, if the Turks advanced, the Arab tribe called the Harb between them and Rabegh would join them and all would be lost. His father would then put himself at the head of his few troops and die fighting in defence of the city. At this point the telephone bell rang and the Sheriff himself from Mecca spoke to Abdulla. Abdulla told him what was being said, and the Sherif answered, "Yes, that is so! The Turks will only enter over my dead body," and rang off. Abdulla smiled a little and asked whether in order to prevent such a disaster a British brigade, if possible composed of Mohammedan troops, might be sent to Suez, with ships waiting there to rush it to Rabegh as soon as the Turks began their march from Medina. To reach Mecca the Turks had to go through Rabegh because of the water supply, and if Rabegh could be held for a little while, he would himself soon lead up his victorious troops to Medina by the eastern road. When he was in position his brothers Feisal from the west and Ali from the south would close in and a grand attack would be made on Medina from three sides.

Lawrence did not like the idea of sending troops to Rabegh, and replied that there were difficulties about providing shipping for a whole brigade. There were no wholly

Mohammedan regiments in the British Army, and a brigade was not large enough anyhow. Ships' guns would defend the beach, which was all that the brigade could defend, just as well as men on the shore. Moreover, if Christian troops were sent to the assistance of the Holy City against the Turks, it would cause bad feeling in India, where the action would be misunderstood; already there had been great excitement in India when a small British Fleet had bombarded the Turks at Jiddah, the port of Mecca. Still, he would do his best and tell the British in Egypt what Abdulla's views were. Meanwhile might he go to Rabegh, see what the country was like and also talk with Feisal? He could find out from Feisal whether the hills could be held against the Turks if more help in arms and stores were sent from Egypt.

Abdulla consented but had to get permission from his father; which after some difficulty (for Hussein was very suspicious) was given. Abdulla wrote to his brother Ali telling him to mount Lawrence well and convey him safely and speedily to Feisal's camp. This was all that Lawrence wanted. That night a sad-looking brass band, in tattered Turkish uniforms, whom Abdulla had captured at Taif played them Turkish and German tunes, and Abdulla told Lawrence of the plans he had made some time before for winning freedom from the Turks by the simple method of detaining important pilgrims to Mecca and holding them as hostages: but Feisal had disagreed. Then Abdulla asked Lawrence how many generations back King George could trace his ancestry: Lawrence replied, "Twenty-six generations; to Cedric the Saxon." (Or however many it was: I have forgotten, but of course, Lawrence knew.) Abdulla

proudly remarked that this was not bad, but that he could go seventeen better. Clearly Abdulla was not the prophet. Next day Lawrence took boat to Rabegh and there gave the letter to Ali.

Lawrence took a fancy to Ali, who was the eldest of the four brothers, a man of thirty-seven: he was pleasant mannered, well read in Arabic literature, pious, conscientious; but he was a consumptive and his weakness made him nervous and moody. If Feisal was not what Lawrence hoped him to be, Ali would perhaps lead the revolt very fairly well. With Ali was another brother, Zeid, a boy of nineteen. He was calm and flippant and not zealous for the Revolt. He had been brought up in the harem and had not yet found himself as a man of action; but Lawrence liked him and he was more pleasant than Ali, who did not like the idea of a Christian, even with the permission of the Sherif, travelling in the Holy Province. Ali did not allow Lawrence to start until after sunset lest any of his followers, whom he could not trust, should see him leave the camp. He kept the journey a secret even from his slaves, gave Lawrence an Arab cloak and headcloth to wrap round his uniform and told the old guide who was to go with him to keep his charge from all questioning and curiosity by the way, and to avoid all camps. The Arabs in Rabegh and the district were of the Harb tribe whose chief was pro-Turkish and had fled to the hills when Ali came to Rabegh with his army. They owed this chief obedience, and if he heard of Lawrence's journey to Feisal, a band of them might be sent to stop him.

Lawrence, out of training after two years of office work in Cairo, found the journey trying, though the experience

of riding a first-class camel of the sort trained in its paces for Arab princes was new and delightful. There were no good camels in Egypt, or in the Sinai Desert, where the animals though hardy and strong had not been properly trained. The party rode all night except for a short rest and sleep between midnight and the grey dawn. The road was at first over soft flat sand, along the coast between the beach and the hills. After some hours they struck the bed of what in the short rainy season of Arabia is a broad flood-river, but now was merely a wide field of stones, with here and there clumps of thorn bushes and scrub. Here the going was better for the camels and in the early sunlight they made a steady trot towards Masturah, where was the next watering-place out from Rabegh on the pilgrims' road. Here the guide's son watered the camels, climbing twenty feet down the side of the stone well and drawing up water in a goatskin, which he poured into a shallow trough. The camels drank about five gallons each, while Lawrence rested in the shade of a ruined stone wall, and the son smoked a cigarette.

Presently some Harb tribesmen came up and watered their she-camels. The guide did not speak to them, for they belonged to a clan with whom his own people, their neighbours, had until recently been at war and even now had little friendship. As Lawrence watched the watering two more Arabs arrived from the direction in which he was bound. Both were young and well mounted; but one was dressed in rich silk robes and embroidered headcloth, the other more plainly in white cotton with a red cotton head-dress, evidently his servant. They halted beside the well and the more splendid one slipped gracefully to the ground

without making his camel kneel and said to his companion: "Water the camels while I go over there and rest." He strolled over to the wall where Lawrence was sitting and pretended to be at his ease, offering a cigarette just rolled and licked. "Your presence is from Syria?" he asked. Lawrence politely parried the question, not wishing to reveal himself, and asked in turn: "Your presence is from Mecca?" The Arab also was unwilling to reveal himself.

Then there a comedy was played which Lawrence did not understand until the guide explained it later. The servant stood holding the camels' halters waiting for the Harb herdsmen to finish their watering. "What is it, Mustafa?" said his richly dressed master, "Water them at once!" "They will not let me," said the servant dismally. The master grew furious and struck his servant about the head and shoulders with his riding stick. The servant looked hurt, astonished and angry, and was about to hit back when he thought better of it and ran to the well. The herdsmen were shocked and out of pity made way for him. As his camels drank from their trough they whispered, "Who is he?" The servant answered, "The Sheriff's cousin, from Mecca." The herdsmen at once untied bundles of green leaves and buds from the thorn trees and fed the camels of this honourable visitor. He watched them contentedly and called God's blessing on them: soon he and his servant rode away south along the road to Mecca, while Lawrence and his guides went off in the opposite direction.

The old guide began to chuckle and explain the joke. The two men were both of noble birth. The one who played the part of master was Ali ibn el Hussein, a sheriff, the other was his cousin. They were nobles of the Harith tribe and

blood enemies of the Harb clan to which these herdsmen belonged. Fearing that they would be delayed or driven off the water if they were recognized, they pretended to be master and servant from Mecca. Ali ibn el Hussein afterwards became Lawrence's best friend among the Arab fighting men and at one time saved his life: he had already made a name for himself in the fighting at Medina and had been the leader of the Ateiba tribesmen in much camel-fighting with the Turks. Ali had run away from home at the age of eleven to his uncle, a famous robber chieftain, and lived by his hands for months until his father caught him. The old guide grew enthusiastic in his account of Ali, ending with the local proverb, "The children of Harith are children of battle."

The day's ride which began over shingle continued over pure white sand. The glare dazzled the eyes, so that Lawrence had to frown hard and pull his head-cloth forward as a peak over his eyes and beneath them too. The heat beat up in waves from the ground. After a while the pilgrims' road was left and a short cut was taken inland over a gradually rising ground of rock ridges covered with drift sand. Here grew patches of hard wiry grass and shrubs, on which a few sheep and goats were pasturing. The guide then showed Lawrence a boundary stone and said with some relief that he was now at home in his own tribal ground and might come off his guard.

By sunset they reached a hamlet of twenty huts where the guide bought flour and kneaded a dough cake with water, two inches thick and eight across. He cooked it in a brushwood fire that a woman provided for him and, shaking off the ashes, shared it with Lawrence. They had come

sixty miles from Rabegh since the evening before and still had as far again to go before they reached Feisal's camp. Lawrence was stiff and aching, his skin blistered and his eyes weary. They stopped at the hamlet for two hours and rode on in pitch darkness up valleys and down valleys. Underfoot it seemed to be sand, for there was no noise, and the only change came from the heat of the air in the hollows and the comparative coolness of the open places. Lawrence kept on falling asleep in the saddle and being woken up again suddenly and sickeningly as he made a clutch by instinct at the saddle-post to recover his balance. Long after midnight they halted, slept for three hours and went on again under a moon. The road was among trees along another watercourse with sharp-pointed hills on either side, black and white in the monlight: the air was stifling. Day came as they entered a broader part of the valley with dust spinning round here and there in the dawn wind. On the right lay another hamlet of brown and white houses looking like a doll's village in the shadow of a huge precipice thousands of feet high.

From the houses after a while came out a talkative old man on a camel and joined the party. The guide gave him short answers and showed that he was unwelcome, and the old man to make things easier burrowed in his saddle pouch and offered the party food. It was yesterday's dough cake moistened with liquid butter and dusted with sugar. One made pellets of it with the fingers and ate it that way. Lawrence accepted little, but the guide and his son ate greedily, so that the old man went short: and this was as it should be, for it was considered effeminate for an Arab to carry so much food on a journey of a mere hundred

miles. The old man gave news of Feisal; the day before he had been repulsed in an attack and had had a few men wounded: he gave the names of the men and details of their wounds.

They were riding over a firm pebbly ground among acacia and tamarisk trees and their long morning shadows. The valley was like a park; a quarter of a mile broad. It was walled in by precipices, a thousand feet high, of brown and dark-red with pink stains, at the base were long streaks of dark-green stone. After seven miles they came to a tumbledown barrier which ran across the valley and right up the hill-sides wherever the slope was not too steep to take the wall: in the middle were two walled-in enclosures. Lawrence asked the old man what the wall meant. He answered instead that he had been in Damascus, Constantinople and Cairo and had friends among the great men of Egypt, and asked whether Lawrence knew any of the English there? He was every inquisitive about Lawrence's intentions and tried to trip him in Egyptian phrases. Lawrence answered in the Syrian dialect of Aleppo, whereupon the old man told him of prominent Syrians whom he knew. Lawrence knew them too. The man then began to talk local politics, of the Sheriff and his sons, and asked Lawrence what Feisal would do next. Lawrence, as usual, avoided answering, and indeed he knew nothing of Feisal's plans. The guide came to the rescue and changed the subject. Later Lawrence found that the old man was a spy in Turkish pay who used to send frequent reports to Medina of what came past his village for Feisal's army.

After a long morning's travel, through two more valleys and across a saddle of hills, the party found itself in a third

valley, where the old spy had told them that they would soon find Feisal. In this valley they stopped at a large village where there was a strip of clear water two hundred yards long and twelve wide, bordered with grass and flowers. Here they were given bread and dates by negro slaves—the best dates Lawrence had ever tasted—at the house of a principal man. The owner was, however, away with Feisal and his wife and children were in tents in the hills, looking after the camels. The climate was feverish in these valleys and the Arabs only spent five months in the year in their houses: in their absence the negros did the work for them. The black men did not mind the climate and prospered with their gardening, growing melons, marrows, cucumbers, grapes, tobacco, which gave them pocket-money. They married among themselves, built their own houses and were well treated by the Arabs. Indeed so many of them had been given their freedom that there were thirteen purely negro villages in this valley alone.

After their bread and dates, the party went on farther up the valley, which was about four hundred yards broad and enclosed by bare red and black rocks with sharp edges and ridges, and soon came upon parties of Feisal's soldiers and grazing herds of camels. The guide exchanged greetings with them and hurried his pace; they pressed towards the hamlet where Feisal was encamped. Here there were about a hundred mud houses with luxuriant gardens. They were all built upon mounds of earth twenty feet high, which had been carefully piled up, basket-full by basket-full, in the course of generations. These mounds became islands in

the rainy season, with the flood-water rushing between them. At the village where they had just been there were scores of similar islands, but hundreds more had been washed away and their occupants drowned in a cloud-burst some years before; and eight-foot wall of water had raced down the valley and carried everything before it. The guide led on to the top of one of these mounds where they made their camels kneel by the yard-gate of a long low house. A slave with a silver-hilted sword in his hand took Lawrence to an inner court. The account of Lawrence's meeting there with Feisal can best be given in Lawrence's own words:

"On the farther side of the inner court, framed between the uprights of a black doorway, stood a white figure waiting tensely for me. I felt at first glance that this was the man I had come to Arabia to seek—the leader who would bring the Arab Revolt to full glory. Feisal looked very tall and pillar-like, very slender, in his long white silk robes and his brown headcloth bound with a brilliant scarlet and gold cord. His eyelids were dropped; and his black beard and colourless face were like a mask against the strange still watchfulness of his body. His hands were crossed in front of him on his dagger.

I greeted him. He made way for me into the room and sat down on his carpet near the door. As my eyes grew accustomed to the shade, they saw that the little room held many silent figures, looking at me or at Feisal steadily. He remained starting down at his hands, which were twisting slowly about his dagger. At last he inquired softly how I had found the journey. I spoke of the heat and he asked how long from Rabegh, commenting that I had ridden fast for the season.

'And do you like our place here in Wadi Safra?'

'Well; but it is far from Damascus.'

The word had fallen like a sword into their midst. There was a quiver. Then everybody present stiffened where he sat, and held

his breath for a silent minute. Some, perhaps, were dreaming of far-off success: others may have thought it a reflection on their late defeat. Feisal at length lifted his eyes, smiling at me, and said, 'Praise be to God, there are Turks nearer us than that.' We all smiled with him, and I rose and excused myself for the moment."

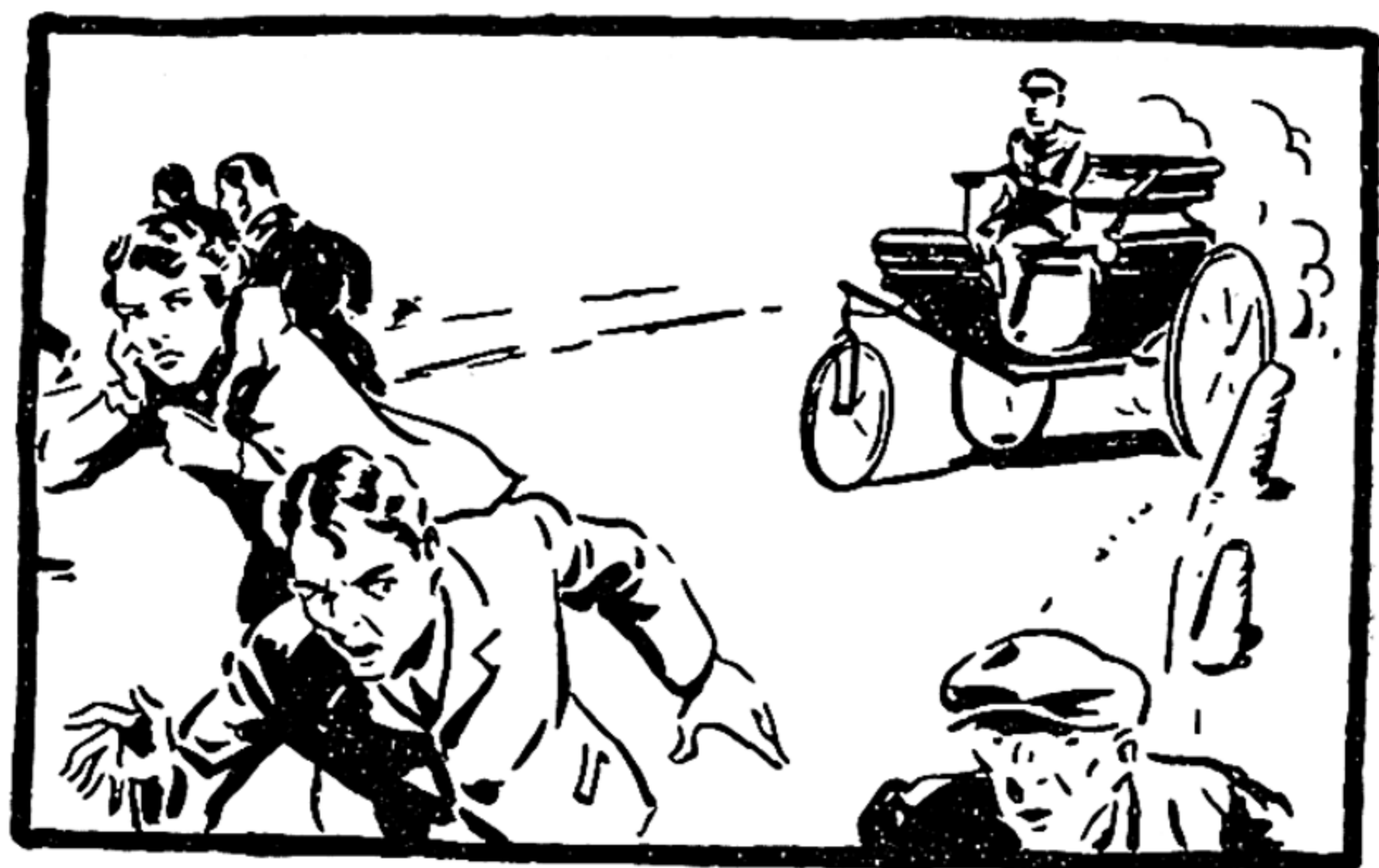
ROBERT GRAVES, *Lawrence and the Arabs*.

KARL BENZ

THE author of *The Invention of the Automobile*, from which this extract is taken, truly points out that very many people would be unable to name the inventor of the motor-car. Yet nothing has more influenced modern life throughout most of the world.

Karl Benz was the son of an engine-driver and the grandson of a blacksmith. The first ideas of a horseless vehicle began smouldering in his brain when he was an engineering student. He carried out his first experiments in 1883-4, when he was making stationary two-stroke gas engines in a dingy workshop in a back street in Mannheim. He experimented single-handed and in secret, as his business partners had no patience with what to them was a waste of time and money. Men of less courage would have broken under the strain and hardships which the ten years' study of the problem entailed for Benz and his family.

The magnitude of his task is difficult to realize. Benz had never seen any sort of motor vehicle, he had no efforts of previous experimenters for a guide, he had to solve for himself all the problems of the motor engine and of the transmission of its power to the vehicle. But he tenaciously held to his idea, and his brilliant abilities, his courage and faith brought success in the end, as our extract shows.



KARL BENZ DRIVES HIST FIRST CAR

It is not easy for the lay mind to "sense" the feelings of the inventor when that supreme moment arrives for the product of his brains to be put to the first practical test. Only creative genius is capable of producing such an emotion and only so in the realm of scientific and like achievement, for the musician has his symphony before him and a sight of his manuscript conveys nearly as much to his sense of tone as does an actual performance of the work: a few dots and other signs suffice to tell him whether or not he has reached the goal of his ambition. The poet knows the lyrical beauty of his words and the painter can see the effect of his own genius, but it is different with the engineering inventor: his calculations and drawings may be accurate to a degree, but in taking a step into the unknown, as indeed was Benz when the day arrived for his vehicle

to propel itself without physical aid, there is always the possibility that some dark force, hitherto unsuspected and unknown, may show itself and cause a complete reconsideration of the whole problem or prove the *coup de grâce* to the inventor's ambitious plans. Failure is not offset by an expenditure, either normal or abnormal, of genius, time and energy, and success does not consist of these three ingredients in solidified form. Success is rarely visible when the first attempt is made to apply an invention, but failure is far more easily discernible, and few see it more plainly than the inventor himself.

For rather more than ten years, the dominant thought in Benz' mind had been the production of a horseless vehicle; he had encountered every obstacle imaginable to achieve this end, and now, in the spring of 1885, his crude-looking contraption stood before him waiting to prove to a highly sceptical world whether it would perform its allotted task or prove that its inventor was nothing more than an engineering crank.

Beyond a few rumours that he was engaged on making a three-wheeler which would go by itself, no word had leaked out about what he was doing. He had no wish to have the limelight of public attention focussed on him and his work until he was satisfied, by preliminary tests, that it would act up to his expectations, and so he decided to say nothing, and merely drive his car round and round the yard outside his workshop in the hope that defects would come to light before any official trials. There was nothing more than a small cinder track on which he could run, but it was well screened, and the public could see very little of what was going on.

It was a dramatic moment; some benzine was poured into the carburettor, some water into the small tank over the engine, a workman put a spot or two of oil from a can on to the exposed rear end of the cylinder, and a few hefty pulls at the horizontal flywheel sufficed to bring this strange machine to life. The maximum speed of its engine was approximately 250 r.p.m., while its h.p. at that speed was about 1. Then came the dramatic moment of Benz to drive it from his workshop to the cinder track outside. It will be remembered that it only had one speed, and it will therefore not come as a surprise to hear that, as soon as the belt was run from the loose to the fixed pulley, the engine promptly stopped. The first lesson in driving had been learned: never make a single-cylinder engine do any work until it is running fast! A couple of workmen pushed it so that the belt ran on to the loose pulley again and then an effort was made to restart the engine. There was nothing doing. Benz himself tried, but still it would not come to life again. At last, Benz got into, or rather on to, the driving seat, the belt was run on to the fixed pulley once more and then the vehicle was pushed. There was a splutter and then an explosion and for the first time in history a vehicle was being driven by an internal-combustion engine.

Round and round Benz careered, with numerous workmen running behind all shouting words of encouragement. Frau Benz, who was present, could hardly contain herself for excitement; she had not only watched and encouraged her husband in his efforts, but had, with her own hands, helped him on numerous occasions. She too ran with the others, clapping her hands in her admiration, but on the fourth round there was a sudden cessation and the vehicle

came to a standstill; a hasty examination showed that the coil refused to buzz and the trouble proved to be a broken ignition wire. This was quickly put right, and once more the procession continued, until a broken side chain finally put a stop for the day, to further experiments. It was a day in Benz' life which he never forgot, for it was on that spring day in 1885 that the death-knell of the horse, as a means of transport, was sounded.

Having satisfied himself that he had solved the principal problem, Benz was content to consolidate and improve his invention slowly and at his leisure. For a few weeks prior to this trial, his work on gas-engines had been somewhat neglected, for his horseless vehicle was rapidly taking shape and he could give no attention to anything else. Now, however, he could devote his spare hours to it and concentrate on his two-stroke gas-engines once more, which were still the backbone of his small business. His partner, Max Rose, had been showing signs of uneasiness lately at so much work on the automobile and so many workmen being engaged thereon, but he had shown great patience, and Benz was anxious to respond to his wishes.

Until the autumn of the same year, therefore, Benz might not have had a horseless vehicle for all the time he spent on it during working hours, but each holiday and before the work of the day started, his hand was for ever at work on the apple of his eye. A new pair of side chains was procured, far stronger than the original ones, the engine was taken out and dismantled and a better mounting for the battery arranged. Then a local carriage builder was called in to provide the seat shown in the illustration, in lieu of the wooden box which had served this purpose

during the first trial round the cinder track. When, finally, all was ready for further trials and the paint-brush had been at work to make the vehicle look comparatively respectable, Benz felt that there was no further need for concealing his invention. The fiat went forth therefore that, on a certain day in the autumn of 1885, he would drive his horseless carriage along the road outside his workshop, and any who were interested were free to witness this epoch-making attempt. He and his partner had invited numerous friends and relatives to be present, and these were, of course, admitted inside the gate leading to his workshop; among them were Frau Benz and their two sons, Eugen and Richard, aged respectively 12 and 10. Frau Benz was to occupy the one passenger seat.

A crowd of people had congregated along the road on which he was to travel to witness the strange sight of a vehicle proceeding along without horses. The guests arrived, a brief inspection was made and an explanation given, in regard to its bare principle, and then Karl Benz mounted the driver's seat and the flywheel was swung: not a single explosion could be produced. For several minutes these efforts continued, until finally Benz worked the belt on to the fixed pulley and several assistants pushed hard. Alas; the hand of Nemesis was over the company that day! The engine fired right enough, but in his enthusiasm to hear this welcome music and his keen anxiety not to stop it lest it might not start again, Benz was paying a minimum of attention to the steering, and so it came about that instead of sailing proudly down the road with his wife at his side, amidst the deafening cheers of all present, the brick wall which surrounded his yard was noticed too late; there was

a hasty grab made for the side lever which applied the one primitive brake the vehicle possessed, but all to no purpose. There was a heart-rending crash which nearly threw both Benz and his wife over the front wheel, and there they were with the whole of their vehicle bent and broken almost out of recognition!

If a catastrophe like this had happened in this country, it would be safe to say that the comical side of the situation would have been dominant, but not so on the occasion in question. Those friends of the inventor who considered he was attempting the impossible seemed to have at their very feet more than ample proof of their misgivings, and they were not slow in emphasizing the point among themselves, while others who thought they saw some possibility in the coming of the horseless carriage were loud in their sympathy. Frau Benz burst into tears when she beheld the labour of years apparently destroyed almost before its birth, while Benz himself could offer no explanation which would satisfy the sceptics. But there it was; the front wheel and steering were pushed back and broken, the frame was fractured and distorted, and there was nothing for it but to carry and half push the wreck back into the workshop. A hasty examination on the part of the inventor proved the truth of the saying that there is nothing so bad that it cannot be worse. The rear part of the vehicle had escaped injury, and it merely remained for Benz and his assistants to dismantle the front part, straighten or replace what parts were damaged, and then to begin his trials afresh.

It did not take him long to make up his mind that on his next trial there should be no "official ceremony" in the way of invited guests; he would take his vehicle out on the

road during the quietest part of the day and endeavour to coax it into behaviour with as few inquisitive eyes around him as possible. When some of its teething troubles had been overcome, then, and only then, would he put it through its paces under public limelight.

Well within a week the damage had been put right, and then came the supreme moment for the test to be carried out. So far as the attempt being made in comparative secrecy was concerned, it swiftly came home to Benz that to drive his horseless vehicle along a public street and attract a minimum of attention was about as feasible as driving in secret a herd of rhinoceros across Piccadilly Circus while the January sales are on. The engine was started up, Frau Benz once again took her seat beside her husband, the gates were thrown open and the driving belt guided from the loose pulley to the fixed. There was no shadow of doubt about it this time; they were most certainly going along "without visible means of propulsion," and it did not take the onlooker long to appreciate that they were witnessing something quite out of the common. The inevitable crowd collected as though by magic, all running to keep up with this strange machine, while Benz, with his wife by his side, as proud as a couple of peacocks, and quite reasonably so, proceeded to execute minor manœuvres to demonstrate the control he had over his vehicle. For rather more than one hundred yards they proceeded thus, until the engine suddenly began to run at an altogether abnormal speed and the vehicle came to a standstill. An examination proved that the belt had pulled through its fastener, so the two of them, aided by at least one sympathetic observer, proceeded to man-handle the machine back over

the route it had come, to the accompaniment of much laughter and jeers from the crowd.

Truly, it was an undignified return, but it had proved to Benz that all his theories were right, and that the automobile was a thoroughly feasible machine. On the next attempt, a whole kilometre was covered non-stop at a speed of twelve kilometres per hour, before manual assistance was required. At each subsequent attempt, a slightly further distance was covered, but by this time the whole of Mannheim had got wind of these strange happenings. Each time the vehicle was taken out, a huge crowd followed, and a stop on the road entailed vast numbers flocking round the machine to the discomfort of the inventor and his assistants and a blockage in the roadway. This caused Benz to wonder how long the police authorities would remain inactive; a word from them would mean total prohibition of his vehicle on the public streets, so he decided that, before he would make any further attempts, he would rid his vehicle, as far as humanly possible, of these constant attacks of the sulks, so that he could at least drive it there and back unaided.

Furthermore, he would not make any attempt before nightfall, in the hope that the streets would be comparatively quiet. There were two circles in Mannheim which Benz was determined to cover non-stop. The smaller one was from his workshop, up the Waldhofstrasse to Waldhof and back via Kaeferthal. The larger circle was along the same route but extended to Sandhofen; if he died in the attempt, so he told his wife, his 1-h.p. vehicle, with one speed only, no radiator, an engine turned over on its side and various other features which have already been

explained, should carry himself and one passenger round these two circles and return to his workshop. Night after night, between the hours of ten and eleven, the engine was started up and the attempt made, but with maddening regularity something came unstuck *en route*. Gradually the distance covered, before the inevitable breakdown took place, began to lengthen, until on one never-to-be-forgotten evening, he had the supreme triumph of covering both circles and returning to his workshop without a single stop. It was a triumph of mind over matter, and one which should rank in importance with the initial journey of George Stephenson.

By this time the newspapers were beginning to take interest in these attempts, as the following report will show, which appeared in the *Neue Badische Landeszeitung* on June 4th, 1886:

"It will be of considerable interest to all lovers of the velocipede to learn that a great advance on the ordinary type of machine has been made by an invention of Messrs. Benz and Company. This firm, which has already gained some reputation through the manufacture of gas-engines with a recently patented form of ignition, has constructed a three-wheeled velocipede propelled by a gas-engine on similar lines to their stationary models. The engine has a cylinder-bore of 9 cm., and is located between the two rear wheels and supported on springs over the rear axle; in spite of its compactness, it develops nearly one horse power, and revolves at three hundred revolutions per minute, by means of which the speed of the vehicle can be increased to that of an ordinary passenger train (*sic!*).

"Over the engine, which runs on a species of liquid gas, is a reservoir sufficient for a considerable distance, and above this is a seat for two persons mounted on double springs, in front of which are found the brake and steering levers. Another lever sets the vehicle in motion and causes it to stop. This is accomplished by

guiding the belt, which transmits the power from the engine to the vehicle itself, on to a loose or fixed pulley. The whole velocipede is not much larger than an ordinary tricycle, and it has a pleasant and striking appearance.

"There is no doubt that this engine-velocipede will make a strong appeal to a large circle, as it should prove itself quite practical and useful to doctors, travellers and lovers of sport."

The same paper made a further announcement on July 3rd, 1886:

"A velocipede, some details of which have already been given in these columns, driven by an engine run on a form of liquid gas and manufactured by the gas-engine firm of Benz and Company, was tested early this morning in the Ringstrasse with considerable success."

A long article appeared in the *Generalanzeiger der Stadt Mannheim* on September 5th, 1886, of which the following is an extract:

"*Carriage driven by a Gas-engine.*—We have already informed our readers that Mr. Karl Benz, of the firm of Benz and Co., manufacturers of gas-engines, and inventor of gas-engines with electric ignition, has constructed a horseless carriage which obtains its motion by means of a gas-engine; the invention has been patented. We saw this vehicle while it was in process of construction and we saw it again a few months ago being driven under its own power. The very first test satisfied us that by this invention of Mr. Benz, the problem of the horseless carriage was solved. But this is not to say that the vehicle contained no defects which by the exercise of experiments and perseverance would be eliminated. Nothing else could be expected in the circumstances. Such work, no less difficult than the invention itself, can now be regarded as completed, and Mr. Benz is now taking in hand the construction of horseless carriages for all practical purposes.

"We have every confidence that a big future lies before this invention, for the machinery can be set in motion with a minimum

of difficulty and affords the cheapest means of transport at the utmost speed for business journeys, tourists, etc."

On page 137 (volume 2) of *The Year-book of Natural Science* for 1886, the following notice appeared:

"The engine manufactured by Benz and Company is, on the other hand, not only suitable for boats, but for carriages and particularly for velocipedes. The piston is driven by an explosion of gas formed by a mixture of vapour and air which is carried in an apparatus attached to the machine. The mixture is effected automatically and calls for practically no attention on the part of the driver."

While these early experiments were proceeding, the business of manufacturing gas-engines continued to expand, and additional mechanics were engaged to cope with the growth. Short journeys in the neighbourhood of Mannheim were undertaken daily, and it was not long before the construction of other cars on similar lines was put in hand. A second speed soon became essential to enable the car to climb inclines, etc., and this was effected by a type of sun-and-planet gear, for which Benz was granted a patent on April 8th, 1887. A larger engine was constructed which developed something like 3-h.p. and this was fitted to a new vehicle with wooden wheels. In 1888 an improvement in the springing was brought about by fitting a full elliptic spring to the front wheel, while the steering was improved by a rack-and-pinion type of steering gear.

The tank for carrying the supply of water was enlarged, so that the larger engine should not overheat; a brake acting on both the rear tyres was designed, and the counter-shaft was lowered to obviate the risk of the pulleys coming in contact with the passenger's feet. The control lever

for running the belt from the fixed to the loose pulley, and vice-versa, was improved, while, as if to give a touch of real luxury, a hood was fitted, but whether it was ever possible to have this in use if there were any wind is not recorded.

Certain of his mechanics were allowed to drive, but Benz made it a rule that if any of them were caught driving at an excessive speed the penalty was that for fourteen days they must work at the bench. After one or two had been punished in this way, he felt that he had satisfactorily damped all attempts at dangerous driving, and he was actually on the point of undertaking a journey in the Black Forest one day when he received notification from the chief of police at Mannheim that his presence was desired at a certain hour. In the knowledge that he had always been particularly careful to drive slowly, he could only conclude that one of his mechanics, unknown to him, had been indulging in excessive speed, and that he was about to be made the scapegoat.

He was duly admitted into the presence of the chief of police, and was asked whether he did not know that to drive a vehicle which was propelled by mechanical power in the province of Baden was contrary to the law? He was forced to admit the fact, but at once began a long story about the immense future which lay before the horseless vehicle, the exceedingly difficult task he had had in designing and manufacturing the car, the precautions he had taken to ensure that his employees should always drive at a slow speed, and how any prohibition on the part of the authorities would inevitably give other countries a lead in the future industry. The interview ended by per-

mission being given to him to drive his vehicle within the boundaries of the city, but if he desired to go farther afield, he would have to obtain the consent of the Minister of Baden.

Benz then wrote to the Minister of Baden for authority to drive anywhere in Baden outside Mannheim and was particularly careful not to suggest any speed limit. In due course, he received notification that he could do as he wished, but in no circumstances must the speed of his vehicle exceed twelve kilometres per hour outside the city boundary of Mannheim and six within. Thus he was limited to an ordinary walking pace in Mannheim, and a slow trotting pace in the country!

Now, Benz knew only too well that mere argument would never effect a change in this impossible regulation; if it could not be altered it would mean that the horseless vehicle would never develop in Germany. It would be hampered by a law which was applicable only to slow-going horse cabs, and he foresaw that other countries, as soon as they heard of his experiments, would take up the reins and soon get a long start of him. He wondered whether a carefully prepared plot to demonstrate the absurdity of the regulation would not have some effect. With this end in view, he wrote a letter of invitation to the Minister of Baden, asking whether he could have the honour of taking him for a short run on his vehicle. He suggested that the Minister should come to Mannheim by train, where he (Benz) would be happy to meet him at the station with his car and demonstrate it to him. To his delight, he received a reply saying that the Minister and one of his assistants would be pleased to accept the invitation, and he

gave the time of their arrival at Mannheim station. This was exactly what Benz wanted. In the meantime, Benz got into touch with one of the local milkmen, and arranged that at a certain time and at a certain place one of his milk carts was to be passing along a particular street. As soon as Benz' vehicle came into sight with the Minister and his assistant on board, the milk-cart was to pull into one side, and allow Benz to pass; then he was to whip up his horse, go by, and jeer at the vehicle as he passed it. To make quite certain there should be no mistake, a semi-rehearsal was staged and everything went off as arranged.

On the appointed day, the vehicle was duly sent to the station to meet the visitors, but to allay any possible suspicion that the incident about to be enacted was a plant, Benz sent his foreman, Tum, instead of turning up himself, with the strictest instructions that in no circumstances was the speed limit of six kilometres to be exceeded. The exalted gentlemen duly arrived, took their seats on the vehicle, and then began the snail's procession to the factory. The milk-cart duly hove in sight, was passed, and then with a swish of his whip, the driver flew past them, hurling insults at them as he went by. Even before this incident, the two gentlemen showed unmistakable signs of impatience at the slowness of the journey, but when the milk-cart went by, it was more than the Minister could stand.

"Good Heavens, man," he shouted to the chauffeur; "are you going to take all day to cover a mile or so?"

"I could pass almost anything on the road if only I were allowed to do so," replied Tum; "but I am forbidden by the police."

"Never mind about that," said the Minister; "we can't

have milk-carts passing us; push her along as hard as she will go."

The spell was broken; the plot had worked excellently. Benz explained the whole working of the vehicle to them, took them for a further run, and the visit ended by Benz being assured that no further obstacles, in the form of speed-limits, should stand in his path.

Thus freed from an impossible speed-limit, Benz was free to go where he liked and as he liked. He had had the original iron tyre removed from the front wheel and a solid rubber one fitted which gave greater comfort, and he decided to undertake a tour in the Black Forest to see how his vehicle, with its two speeds and larger engine, performed up the hills and to note the effect the vehicle would have on the inhabitants of the villages through which he passed, and on the horses he would meet. With a small store of spare parts and his foreman as companion, he set off on his journey. It was soon apparent to him that not a word about his experiments had reached the ears of those outside Mannheim; the effect of his coming cannot be adequately described. It was as though some diabolical engine of the father of evil had suddenly dropped from the clouds; children fled screaming from him to their houses; mothers made a hasty rush for their offspring and pulled them indoors, bolting the doors as they did so.

A number of the older people, less agile than the others, fell down on their knees as he approached, and made the sign of the cross on their breasts. Horses took fright, and either bolted or performed circus tricks in the middle of the road. One young man fled in terror in front of him, shouting to all that the Devil had come; men repairing the

roads threw down their tools and made off across fields as fast as their legs would carry them. In other villages he passed through, the inhabitants took up an aggressive attitude; large numbers of stones were thrown at Benz, and on one occasion, after a youngster, greatly daring, had struck the front part of the vehicle with a large stone, Benz pulled up, sprinted after the culprit and pulled him, terror-stricken, back to the vehicle to see the machinery working. At one *Gasthaus* at which he wished to spend the night, the host was willing for Benz and his companion to sleep there, but the vehicle would have to be removed and placed in a field opposite in case it exploded and blew them all sky-high!

Everywhere he went with his horseless vehicle, it was the same; in many parts of the country it was regarded as something supernatural. Astonishment, terror and hostility were intermixed, for the inhabitants seldom read newspapers and so missed the brief allusions to the new invention which were beginning to appear in the German Press.

This rather extended tour was not accomplished without many repairs being made; the lifelong aim of Benz had been achieved, but the development of the automobile after Benz solved the problem was left to others. His whole life had been spent in the workshop, and he argued that nothing more was needed to effect a sound horseless carriage than to turn the workshop-method of driving machinery to a new use.

ST. J. C. NIXON, *The Invention of the Automobile.*

LORD GREY OF FALLODON

LORD GREY OF FALLODON sprang from a Northumberland family of country squires, who for generations had played a part in public affairs. His own pleasures lay in the country, but his sense of duty drove him into politics. He was happiest fishing for trout, and watching wild birds, but once he was a member of parliament his abilities and character won for him a prominence that gave him little time for such pursuits.

From 1905 to 1916 Lord Grey was Foreign Secretary. It is strange that the man whose heart was never entirely in politics should have risen to such a high office, should have held it so long, and in such crucial years.

It is possible to consider Lord Grey's life as a failure. His sense of duty prevented him from living the life he loved. His efforts to preserve the peace of Europe suffered the defeat of August 1914, that darkened the rest of his life. He sacrificed his eyesight in his wartime service in the government. When at last release came, and he returned to his birds and books, he could no longer see them. Domestic griefs beset him. Yet as our extract from his biography shows, from this tragic material his serene and strong nature won a greatness that is an inspiration and splendid example.

THE GREATEST ACHIEVEMENT

DURING the seventeen years that passed between Grey's resignation and his death, he was never again in the forefront of national or international affairs. The part he played in the League of Nations Union, in the Liberal Council and in the debates of the House of Lords was not unimportant, but he was always too blind and often too ill to lead a party, or to aspire to office. The amount of public work that he did corresponded to the amount for which he was fit. Whether he would have played a great part if his sight had grown better instead of worse, it is impossible to say. In such a case, the old struggle between his private desires and his sense of public duty might have been renewed. He was spared that, but he was spared little else.

His blindness steadily increased as the years went on, though he sought cures in many quarters but always in vain. To put it in terms of his favourite sport, first he had to give up the dry fly, then ordinary trout fishing, then salmon, till finally in 1932 he writes from Fallodon to Jack Tennant:

I cannot see whether I put my worm into the water or on to the bank. With my ducks I can at any rate feel when they take it out of my hand, and distinguish some of them when they are very close.

It was an irony that tested the unconquerable sanity of his spirit, to be set free at last, too late; the leisure he had longed for was his, and the bounty of nature's loveliness

was spread before him, invisible; every time he stepped from his library door into the garden, he was aware of the old familiar places undergoing the magic revolution of the seasons, but his eyes could scarcely mark the difference between December and May; he heard the birds in the pond that he had dug and in the bushes and trees that he had planted for them in years gone by, but they were voices of friends unseen; and he sat on his favourite height at Ros Camp, though he could hear the curlews call as of old, he could see neither the purple of the heather close at hand nor the green of Cheviot far away.

He was equally cut off from books, of which as life advanced he had grown scarcely less fond. Fortunately he knew much of the best poetry by heart. Almost to the last he painfully read *The Times* political leaders held close up to his eyes, and occasionally wrote short letters by guesswork with his pen. But already by the time the war ended he had to dictate his longer letters, and depended on what was said or read aloud to him for the bulk of his political information. Such activities as he could still pursue were rendered possible largely by the devoted help of his friend, Mr. Henry Herbert, who had the cottage at Fallodon rent-free, and in return did certain things he required: Mr. Herbert read to him and in his absence fed the ducks. He could read to himself continuously only in Braille. The advantage of blindness, he once said to me, was that one could keep one's hands warm while reading in bed, fingering the raised letters beneath the blankets! In the last months of his life he lost, by a final affliction, the sensitivity of his "Braille finger."

The process of deterioration was continuous, but as early as May 1918 he wrote to Captain Barton:

My sense of smell is nearly gone and my eyesight is very feeble and no use in watching birds. I classify the different parts of my body as being of different ages, as thus:

Sense of smell	..	..	aged 99 years	
Eyes	..	..	..	99 "
Stomach	..	..	..	85 "
Sense of hearing	..	..	..	56 " (my age)
Brain	..	..	..	56 "
Heart and lungs	..	..	..	45 "

It makes a very unequal team to get along with.

Other disasters fell thick upon him. Fallodon was burnt down in May 1917. Only the furniture, pictures, and books on the ground floor were saved. After living in the kitchen wing till the war was over, he rebuilt the house, with the old bricks and in the same general style as before but with two storeys instead of three and with some change in the ground plan of the rooms. In February 1923 the Cottage on the Itchen was burnt, and was not rebuilt. How much these two breaches with the past meant to him, readers of this volume can by this time surmise. In 1922 his second marriage gave him a period of real happiness, but in 1928 Pamela, Lady Grey, died; and in the same year his brother Charles, of whom he had become almost as fond as formerly of George, was killed by a buffalo in Africa, as George a dozen years before had been killed by a lion. And besides these private strokes, Grey lived to see his hopes for the pacification of the world shattered, America withdrawn into herself, Europe armed to the teeth, and Germany under the Nazi regime. He foresaw a grim future for mankind,

the more so as he had less than no sympathy with the increasing mechanization of life.

But his private afflictions and public disappointments never broke his courage or soured his serene and constant spirit. Neither in his letters nor in his talk was there any cry of personal pain or even of impatience. He was unfailing in his quiet, humorous observation of life, and his determination to make the daily best of what was left. All who saw him went away cheered and elevated by the strong, even current of his talk, delightful, easy, humorous, sustained without effort high above the level of his griefs. Visitors to Fallodon were always made happy. The spring of fun in him was never dry. He loved to have P. G. Wodehouse read aloud, and to interrupt the reading with shouts of schoolboy laughter. He never showed depression in company, though he had some bad hours when alone. Yet solitude, which he had always loved, must to the end have seemed to him more good than bad, or he would have sought society more, especially after Pamela's death.

G. M. TREVELYAN, *Grey of Fallodon*.

